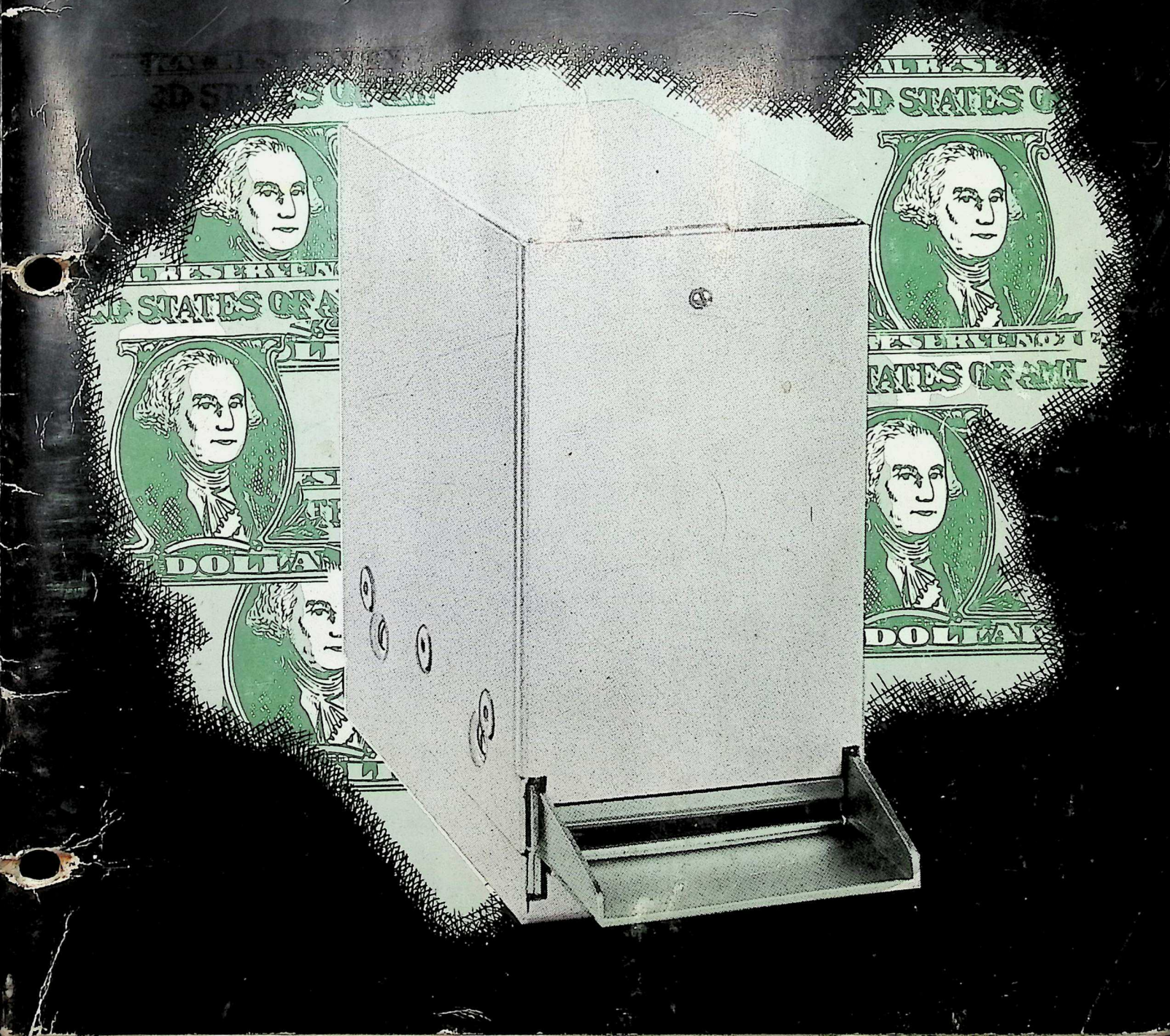
NRI

OPERATION and SERVICE MANUAL

buck passer®

BILL VALIDATOR



FOREWORD

The Buckpasser currency validator represents the culmination of over fourteen (14) years of engineering, manufacturing and application experience in currency validators. We, at NRI, feel that the Buckpasser represents the epitome in currency validators to you, the using customer. Vast field application has proven this to be true simply through positive results.

Warranty

GENERAL — The Buckpasser, NRI 34-XX-XXX Model Series, warranty covers parts for a period of twelve (12) months as defined in the 12 Month Warranty contained below. Proficient repair of the Buckpasser by the customer does not void the warranty provided it does not involve either of the printed circuit boards. Warranty for the components utilized on the printed circuit boards is void when repairs to the boards are made by the customer.

NRI CURRENCY EQUIPMENT

12 (TWELVE) MONTH

WARRANTY: National Rejectors Industries warrants all new currency equipment sold by it to be free from defective material and factory workmanship. NRI will repair or replace (at its option) any part of the equipment which proves to be defective in material or factory workmanship within twelve months of the date of manufacture, subject to the conditions below.

CONDITIONS:

1. This Warranty will not apply to any equipment which has been, in NRI's opinion, subject to: accident, abuse, misuse, neglect, improper installation, improper maintenance or repair.

2. For this Warranty to apply, send the defective part(s) to the NRI Sales and Service Center for your area, or your local NRI Factory Authorized Service Center (FASC). Transportation charges will be borne by the purchaser.

3. If an assembly is returned under this Warranty for repair or replacement of one or more of its parts, a charge will be made for the labor involved in removing and replacing said part(s).

4. This Warranty does not cover parts or labor for an electronic assembly, such as printed circuit boards with solid-state components, that has been repaired by the purchaser.

5. NRI will not be responsible for any expenses incurred by the purchaser incidental to the repair or replacement covered by this Warranty.

6. No person is authorized or permitted to make any other Warranty on NRI's behalf, or to obligate NRI to any liability not strictly in accordance with this Warranty.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY.

National Rejectors Industries • Hot Springs, Arkansas 71901
A Division of UMC Industries, Inc.

NRI

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APPLICATION DATA

OVERALL (ENVELOPE) DIMENSIONS:

The following dimensions are approximate. Specific details of mechanical interfaces are available on request.

HEIGHT:
5¾ inches

WIDTH:
3 inches (Add ⅛ inch, each side, for mounting bosses)

LENGTH:
6 inches (Add 1¼ inches for insertion snout)

WEIGHT:
5 to 7 pounds contingent on model (net).

MOUNTING SPECIFICATIONS:

- Mount in any attitude (3 bosses each side or standard NRI mtg. bkts.).
- Bill insertion (If provided on unit) snout should float in opening of cabinet.
- Electrical connector on unit available in right side, left side, or rear exit (extends 7/16 inch for rear exit and 13/16 inch for side exit). Easy access to connector should be provided.
- Platen opens away from Frame to expose bill movement path and scanning heads. Black side of bill must be inserted next to Frame of unit.
- Provisions should be made to have access to bill path with unit mounted or complete unit easily removed.
- If not used with NRI's Buckstacker the bill cash box must be of configuration such that bills in cash box do not interfere with normal exiting of an accepted bill.

ENVIRONMENTAL:

- Exposure to extreme debris or humidity such as water spray should be avoided.
- Temperature range is 40 deg. F. through 140 deg. F. Exposure to normal operational temperatures below 40 deg. F. should be avoided. This is easily accomplished by using a heating element, thermostatically controlled. Heat source should be located as close to the drive belts as possible.
- Relative humidity — maximum of 98%.

POWER REQUIREMENTS:

- 115 VAC units (97 through 127 VAC)

	Current	Power
Stby	.06 amps	5 watts
Running	.45 amps	40 watts
Surge	1.2 amps	*

- 24 VAC units (22 through 27 VAC)

	Current	Power
Stby	.09 amps	2.1 watts
Running	1.2 amps	35 watts
Surge	6.0 amps	*

  * Surge current occurs when applying power and does not exceed .050 seconds.
- All units have electrical provisions for earth or safety grounding.

CYCLE DURATION:

- 1.1 seconds for accepted bills.
- 1.5 seconds for normally rejected bills.
- Unit should be disabled during vendor cycle to prevent insertion and loss of bill.

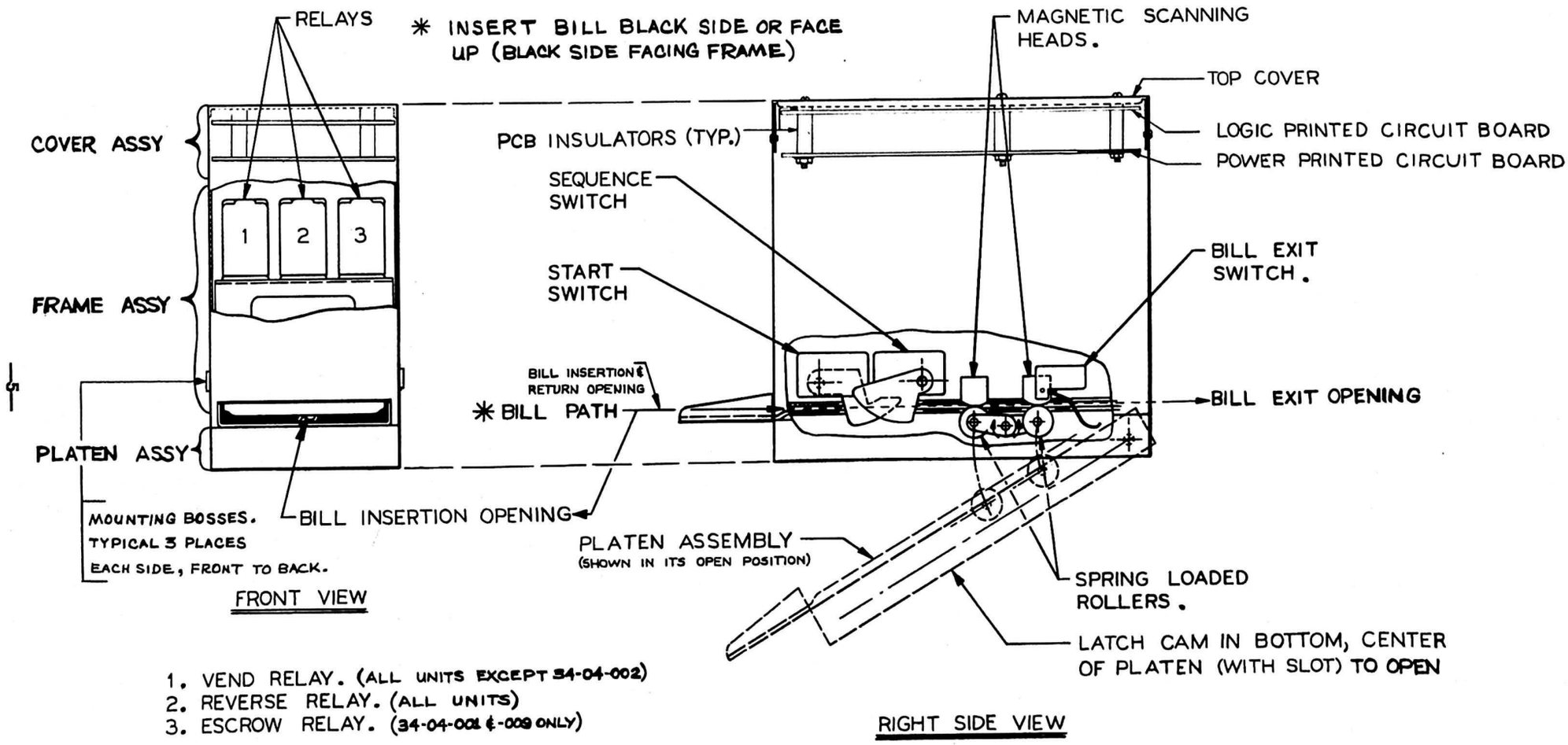
ELECTRICAL INTERFACE:

- Molex nine pin plug, NRI PN 15401-5 with terminal PN 15211-1.
- Located on rear or either side.
- Mating molex nine pin receptacle, NRI PN 15210-4 with terminal PN 15211.

VEND CIRCUIT (INTERNAL TO UNIT)

- Relay contact closure — 3 amps inductive, 5 amps resistive loads maximum.
- Transistor control — .050 amps max., load (contact NRI for specific data).
- Duration is 150 $\pm$ 50 milliseconds after bill exits validator.
- Isolated (not common to any power source) or non-isolated (common to neutral side of input power) circuitry standard.
- The N. C. (de-energized) contacts of the vend relay (when used) should be sensed or utilized with vendor control circuitry to insure correct sequencing to the "ready or standby" condition.
- Solid-state output (transistor) units provide a motor "disable-enable" circuit to the electrical interface.

✳ INSERT BILL BLACK SIDE OR FACE UP (BLACK SIDE FACING FRAME).



1. VEND RELAY. (ALL UNITS EXCEPT 34-04-002)
2. REVERSE RELAY. (ALL UNITS)
3. ESCROW RELAY. (34-04-001 & -009 ONLY)

FIGURE 1 - VIEW OF HORIZONTAL MOUNT UNIT DEPICTING MODULE AND COMPONENT LOCATION
(Typical Of Vertical Mount Units Except For Snout Location)

GENERAL INFORMATION

A. INTRODUCTION

The Buckpasser is NRI's all new currency validator. Various models are available that verify the validity of the United States of America $1 and/or $5 bill denominations of currency. The validation technique features magnetic scanning on which NRI has exclusive patent rights. Twin frequency discriminating scanning heads are utilized to assure optimum security. The authentication of U.S. Currency through use of magnetic scanning offers the optimum security in validation techniques due to depicting precise patterns, through content of ink. The Buckpasser is easily adapted to various forms of script. The magnetic scanning process makes validation of script particularly attractive due to the unparalleled security gained through precision printing of magnetic patterns both visible and non-visible.

This product represents the culmination of over 14 years engineering, manufacturing and application experience in currency validating mechanisms. Paper handling problems are literally eliminated. This is true due to utilizing MOS integrated components to greatly simplify the electromechanical construction. Complex modes and sequences of operation are programmed and controlled by integrated circuitry. The Buckpasser is the standard of the industry simply due to thorough and detailed critiqueing of design para-meters, comprehensive and exhaustive field testing with analysis feed-back, and greatly simplified manufacturing techniques.

Units are available in several configurations. The variables offered through standard models include such things as $1 and/or $5 bill validation, single bill escrow, insertion snout location, isolated and non-isolated vend circuitry, mounting brackets, power requirements (24 AND 115 VAC), and U. L. Approval. The Buckpasser is designated as the NRI 34-04-XXX model series currency validator. The last three digits specify the exact configuration of the unit.

Reliability and longevity of operation has been greatly extended due to simplicity of the electromechanical components. This is possible since the complex logic modes of operation occur electronically. Easily changed plug-in, plug-out components are featured thoughout the unit placing serviceability second to none.

Bill handling is accomplished through a single, unobstructed path (one plane of movement) by two drive belts. These belts maintain continuous contact with a moving bill thus further enhancing the unit's bill handling characteristics. Drive belt wear, stretch and slippage are virtually eliminated due to the minimal loads normally encountered. Belt drive is provided through a gear train (2 gears) that is driven by a silent, permanent magnet, smooth running, direct current motor. There are a total of 3 snap-action switches in the unit. The switches are used to initiate signals to logic circuitry to indicate proper sequence of bill positions. Each switch is of the "miniature size" which has proven itself to offer optimum in reliability through vast industry application. Quick-change relays control the motor reverse, vend and single bill escrow functions. Each function requires a double-pole, double-throw (DPDT) 24 VDC relay.

The Buckpasser is the most compact and smallest validator in the industry. Internal areas are easily accessible via a removable top cover and/or the "snap-open, snap-close" platen that exposes the bill movement path. The magnetic scanning heads are also exposed once the platen has been opened. Mounting position can be of any desired attitude because of insensitivity to the force of gravity. The black side of a bill has ferrous or magnetic properties within the ink, while the green side does not! The scanning heads are contained in the frame opposite the "snap-open, snap-close" platen. Therefore the bill has to be inserted with the black side facing (next to) the frame or mass of the Buckpasser. The head within the portrait area can be inserted with its top to the right or left side with the only criterion being black side next to scanning heads.

NRI's Buckpasser offers the industry the most in currency validator credentials while costing less than all other available validators.

B. MAJOR COMPONENTS AND THEIR GENERAL FUNCTIONS

The major components internal to the Buckpasser are as follows:

1. **TRANSFORMER** — The transformer is required for all 115 VAC units. It reduces 115 VAC to 24 VAC. The secondary voltage of 24 VAC is applied to the power printed circuit board (PCB) and rectified into DC voltage for use within the validator. Units designated for 24 VAC inputs do not require transformers.

2. **POWER PRINTED CIRCUIT BOARD (PCB)** — This board is the outside PCB once the top cover of the unit is removed for inspection. It provides regulated and unregulated direct current volts (VDC) for the Unit. The regulated VDC (+15 VDC) is required for the logic and amplifier circuitry contained on the logic PCB. The unregulated VDC (+37 VDC) is required for the VDC motor and the VDC relays. Motor speed, overall time sequence — T3, and reverse relay driver circuitry is also contained on the Power PCB. The single bill escrow units have additional circuitry on this board that control motor stop (after validation) and motor start to accept or return the bill.

3. **LOGIC PRINTED CIRCUIT BOARD** — This board is located next to the inside of the top cover. This board contains 2 amplifier and frequency discriminating circuit sections for analyzing the magnetic scanning head signals. It also contains all of the necessary circuitry for logic modes of validator operation incurred in "Normal and Abnormal" sequences of operation. Such signals as motor start, motor reverse, bill validate, programmed time sequences T1 and T2, etc., are controlled within this PCB.

4. VDC MOTOR — The motor provides drive to the two drive belts through a worm on the motor's shaft and a worm gear on the drive shaft for the belt pulleys. Contingent on the mode of operation the motor runs in a forward (pulling the bill into the unit) or a reverse (returning the bill) direction. Contained within the motor is an electrical tachometer. The signal generated by the tach is proportional to the speed (RPM) of the motor. Variations in motor speed are eliminated by supplying the tach signal to the motor speed control circuit on the Power PCB.

5. VDC RELAYS — All units use one or more relays. The Motor Reverse Relay is required for all units. Vend circuits featuring a relay contact closure require a second relay, the Vend Relay. Interfaces such as solid state vend signal circuitry (to provide impedance matching and eliminate contact bounce) do not require this relay. Should single bill escrow be a feature within the unit the third relay is required, the ESCROW RELAY. When more than one relay is used they are all directly interchangeable. Each relay is of a double-pole, double-throw (DPDT) 24 VDC configuration. Quick change features are provided through plug-in, plug-out terminal configuration. Once installed the relay's position is secured via relay retaining clips.

6. SWITCHES — All units have three switches. They are miniature type switches of the single pole-double throw (SPDT) design. When inserting the leading edge of a bill, the first switch that the bill actuates (to its normally open position — N. O.) is the Start Switch. The motor starts forward and the bill next actuates the Sequence Switch as it moves into the validator. The bill's leading edge moves past the Sequence Switch, past the two Scanning Heads and then actuates the EXIT SWITCH. In summary, the insertion of a bill makes the Start Switch, the Sequence Switch and then the Exit Switch. If the bill is valid a vend signal is not received until the "trailing edge" of the bill clears the EXIT SWITCH (in the cash box). The sequence in which these 3 switches go to their **make** (normally open — N. O.) **and break** (normally closed — N. C.) positions has to be of a predetermined order or the bill is rejected.

7. SCANNING HEADS — All units use two heads to implement the magnetic scanning process. The signals initated by the scanning heads are a result of the relative motion between the heads and the bill. Each head is secured to a non-conductive (electrically) mounting bracket. Physical location of the head is secured by attaching the head bracket to a bill guide within the frame of the unit. To effectively scan the bill a pressure roller under each head keeps the moving bill firmly against the scanning head. This affords detection of varying fields of strength emitted via the magnetic ink contained within the ink of a valid bill. Impedance matching between the heads and the logic board is assisted via use of coax cable to transmit the signals to the PCB.

8. FRAME ASSEMBLY — All components are contained within the frame with the exceptions of the (1) Cover Assembly and the (2) Platen Assembly. Therefore the validator consists of three module assemblies.

9. PLATEN ASSEMBLY — The platen contains the necessary pressure rollers required to hold the bill in contact with the drive belts. Two pressure roller assemblies are also included to hold the bill in contact with the scanning heads. Openings for the actuators of the three switches (located in the frame) are provided. These openings align with matching ones in the bill guide secured to the frame. Complete bill path exposure is easily accomplished by turning the unlatching cam in the platen cover and pivoting the platen assembly away from the frame.

10. COVER ASSEMBLY — This assembly consists of the Logic and Power PCBs, the board mounting hardware, and the top cover for the validator. The top cover mounts onto the side panels, front and rear, via two screws. PCBs electrically connect to the unit's wire harness by utilizing two quick disconnect twelve pin molex connectors.

SEQUENCE OF EVENTS CHART

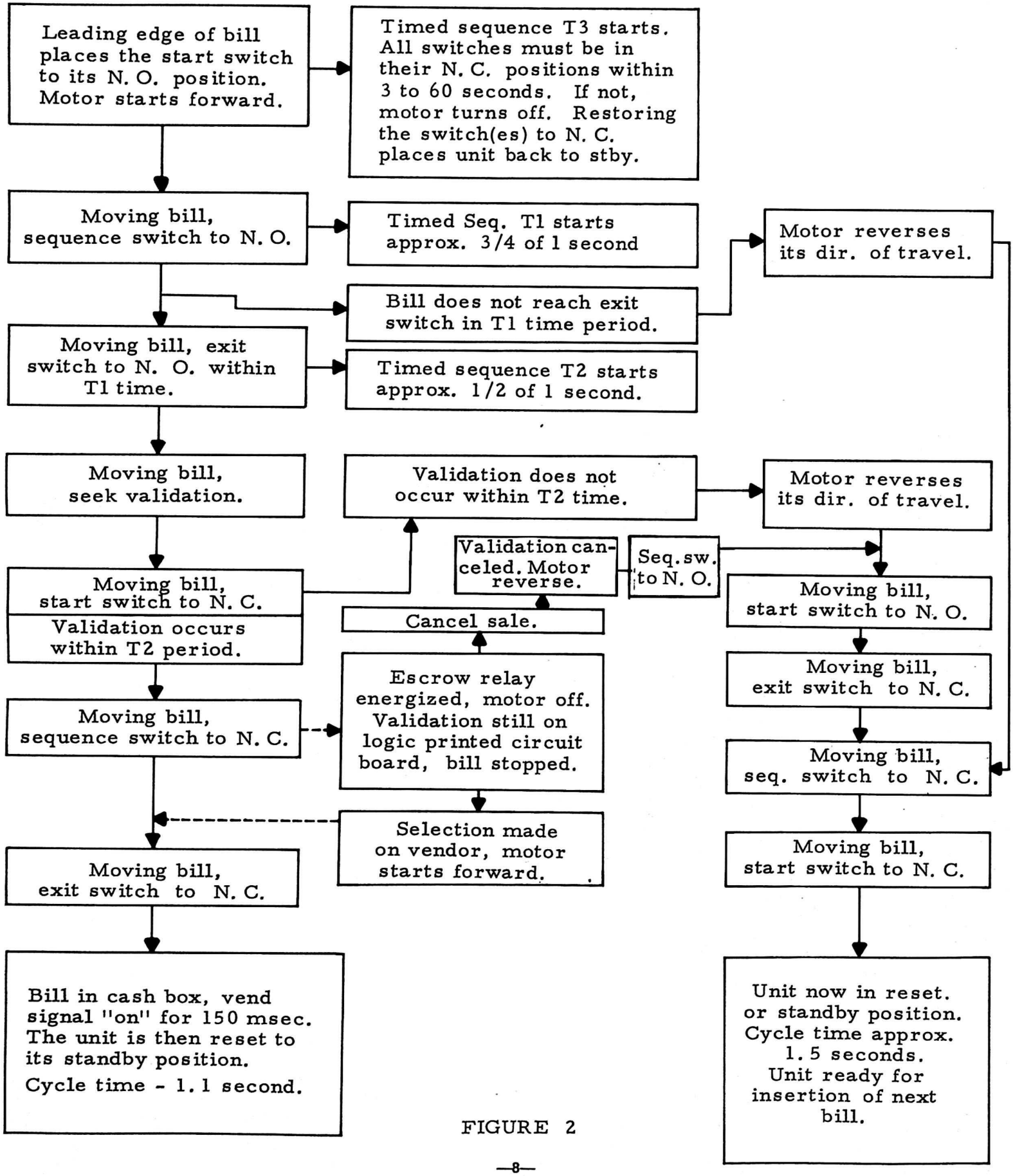

BILL INSERTED
CONTINGENCIES
BILL RETURNED
Leading edge of bill places the start switch to its N. O. position. Motor starts forward.
Timed sequence T3 starts. All switches must be in their N. C. positions within 3 to 60 seconds. If not, motor turns off. Restoring the switch(es) to N. C. places unit back to stby.
Moving bill, sequence switch to N. O.
Timed Seq. T1 starts approx. 3/4 of 1 second
Motor reverses its dir. of travel.
Bill does not reach exit switch in T1 time period.
Moving bill, exit switch to N. O. within T1 time.
Timed sequence T2 starts approx. 1/2 of 1 second.
Moving bill, seek validation.
Validation does not occur within T2 time.
Motor reverses its dir. of travel.
Validation canceled. Motor reverse.
Seq. sw. to N. O.
Moving bill, start switch to N. C.
Validation occurs within T2 period.
Cancel sale.
Moving bill, start switch to N. O.
Moving bill, exit switch to N. C.
Escrow relay energized, motor off. Validation still on logic printed circuit board, bill stopped.
Moving bill, sequence switch to N. C.
Moving bill, seq. switch to N. C.
Selection made on vendor, motor starts forward.
Moving bill, start switch to N. C.
Moving bill, exit switch to N. C.
Bill in cash box, vend signal "on" for 150 msec. The unit is then reset to its standby position.
Cycle time - 1.1 second.
Unit now in reset. or standby position. Cycle time approx. 1.5 seconds. Unit ready for insertion of next bill.

FIGURE 2

SEQUENTIAL DESCRIPTION OF OPERATION

A. NORMAL MODE OF OPERATION

The bill is inserted with the black side facing the frame or mass of the Buckpasser (scanning heads are located on this side of bill path). The leading edge of the inserted bill starts the motor by actuating the Start Switch to its N. O. (normally open) position. The motor provides drive to the two drive belts. This occurs through a worm on the shaft of the motor and a worm gear on the drive shaft for the belt pulleys. The belts are now rotating in the forward (pulling a bill in) direction. Once the Start Switch has been actuated to its N. O. position a programmed time sequence T3 begins. Should the unit continue to run for more than three seconds the T3 function turns the motor off. T3 is known as the overall time sequence and motor shut-down should occur within a 3-60 second time period.

Further insertion of the bill, approximately ¼ inch, places its leading edge into the rotating drive belts. The bill is now being pulled into the unit at a speed of about nine to ten inches per second.

The leading edge of the moving bill now actuates the Sequence Switch to its N. O. position. The signal from the sequence switch is applied to the logic PCB starting a programmed time sequence, T1. Actual position of the moving bill is now important because it has to actuate the Exit Switch within approximately ¾ of 1 second. Should the bill not actuate the Exit Switch within the allotted T1 period the motor reverses its direction of rotation. Reversing of the motor would return the bill.

The bill continues to move forward and actuates the Exit Switch (within the T1 period) to its N. O. position. At this point the Start, Sequence and Exit Switches are all in their N. O. or actuated positions.

Programmed time sequence T2 is now initiated. T2 provides about ½ of one second in which each scanning head must receive the proper signals from the inserted and moving bill. If the T2 sequence expires prior to acquiring the signals that indicate the bill is valid (validation) or the trailing edge of the bill clears the Start Switch (to N. C.) the motor reverses and returns the bill.

With the bill moving past the scanning heads the induced signals are analyzed by the logic PCB. After the signals are accepted as valid the logic board registers a "validation" condition electronically. The bill continues to move in its forward direction. Its trailing edge releases the Start and Sequence Switchs to their N. C. (normally closed) position respectively.

ESCROW UNITS ONLY (For all other units proceed past these three paragraphs)

Units that feature single-bill escrow deviate from normal sequence at this point. The unit now has the Start and Sequence Switches to N. C. positions and a validation in the logic board. For these units the motor is now de-energized. The Escrow Relay is energized. Contacts, on the escrow relay apply **two signals** to the electrical interface. One signal applies the neutral line (115 VAC) to a terminal in the electrical interface connector.

The other signal provides a closed circuit through the contacts of the escrow relay that are isolated from all other internal circuits to the electrical interface. The bill has stopped with its trailing edge between the Sequence and Exit Switch actuators. Either of two signals are now required from vendor, "Selection" or "Cancel Sale". Should the "Cancel Sale" signal be received the validation in the logic board is cancelled. Losing the logic's validation signal starts the motor, in its reverse direction, and returns the bill.

By receiving a "Selection" signal the motor starts and moves the bill in a forward direction.

The bill is continuing to move in its forward direction. The trailing edge of the bill now clears the Exit Switch. The Vend Relay (or vend circuit for solid-state interfaces) is now energized. The motor is de-energized. A vend signal of approximately 150 $\pm$ 50 milliseconds in duration is applied to the electrical interface. Upon completion of the 150 millisecond vend signal the vend relay or circuit is de-energized. The unit is now reset and in its standby position awaiting the insertion of the next bill.

B. REJECT MODE OF OPERATION — (green side of bill next to heads)

All sequences for a valid bill insertion are applicable for this mode of operation up to the point in which the unit seeks a validation condition. The validation does not occur due to the fact that the green side of the bill does not provide signals to the scanning heads. Therefore programmed time sequence T2 expires (½ of 1 second) or the trailing edge of the bill clears the Start Switch **without** the validation occurring. Once the logic PCB receives this deviation from normal sequences the motor reverses its direction and returns the bill.

A synopsis of the events leading to a rejected or returned bill is:

1. The leading edge of the bill starts the motor in its forward direction by actuating the Start Switch to its N. O. position.
2. Further insertion (¼ inch) of the bill allows the belts to pull the bill into the unit.
3. The leading edge of the moving bill actuates the Sequence Switch. Programmed time sequence T1 starts (¾ of 1 second).
4. The Exit Switch goes to its N. O. open position as the leading edge of the moving bill moves past its actuator. Timed sequence T2 (½ of 1 second) is then initiated.
5. The validation that is required prior to the expiration of T2 does not occur. T2 expires or the trailing edge of the bill clears the Start Switch and the bill is returned due to a reversal of motor rotation.

C. ABNORMAL MODES OF OPERATION

If a short object (i. e. business card, etc.) is inserted it is returned because it allows the Start Switch to return to its N. C. position **prior** to actuating the bill Exit Switch. The motor immediately returns the object because of the deviation from the required sequence of actuating the Start Sequence and Exit Switches respectively.

Should the sequence defined in normal modes of operation be deviated from in any manner the validation is cancelled (if it occurred) and the object or bill is returned.

Foreign objects or materials that in some manner jam within the unit do not result in component damage. The T3 time sequence expires, the motor stops, and once the material has been removed the unit is reset to its ready or standby condition.

Currency inserted into the unit **with magnetic content in its ink does not set up a validation** unless a series of very specific and precise patterns are detected. United States Currency consists of unique patterns and types of ink to assist in authentication between the various denominations which are practically impossible to successfully duplicate.

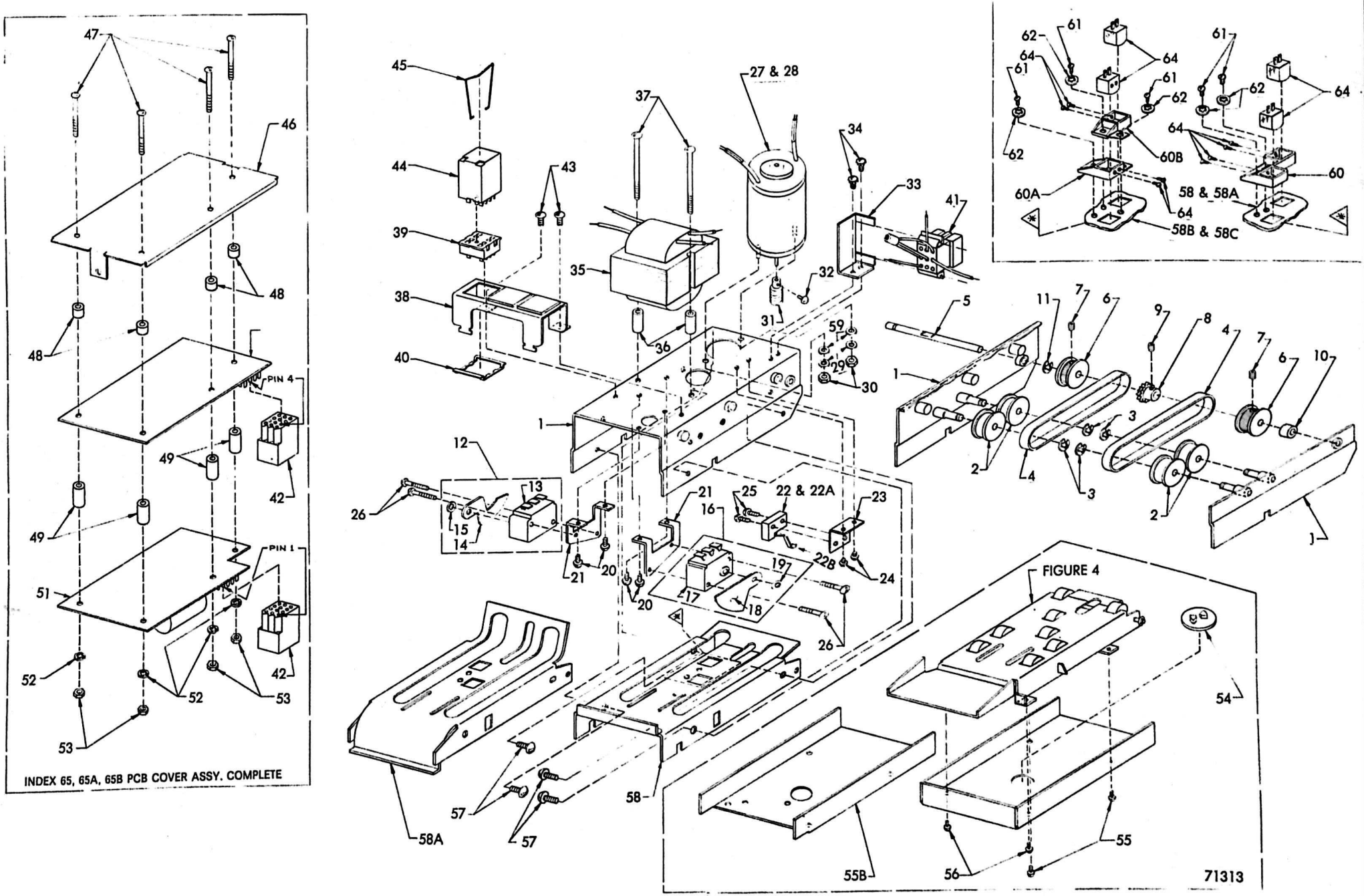


FIGURE 3 COMPLETE 34-04 VIEW, LESS SIDE PANELS AND PLATEN ASSEMBLY

FRAME AND COVER ASSEMBLY

Parts List: Refer to Figure 3

Index No.	Part No.	Description	Quantity
1	18206	Frame Assembly (Includes staked parts and oilite bearings)	1
2	9117-3	Idler Roller, Drive	4
3	8959-6	Ring, Retaining	4
4	18216-1	Belt, Drive	2
5	8792-40	Shaft, Drive	1
6	9117-4	Pulley, Drive	2
7	9472-3	Screw, Set - No. 6-32x1/4"	2
8	18202-1	Gear, Worm (Bronze)	1
9	9472-1	Screw, Set - No. 6-32x1/8"	1
10	8804-256	Spacer (Collar)	1
11	8959-6	Ring, Retaining	1
12	18210	Start Switch Assembly	1
13	9993-18	Switch, Start	1
14	18207	Actuator, Start Switch	1
15	9994	Washer, Springrip	1
16	18210-1	Sequence Switch Assembly	1
17	9993-18	Switch, Sequence	1
18	18211	Actuator, Sequence Switch	1
19	9994	Washer, Springrip	1
20	9453-8	Screw, No. 6-32x1/8"	4
21	18209	Bracket, Start & Sequence Switch Mtg.	2
22	18215	Exit Switch & Short Actuator	1
22A	14143-3	Exit Switch	-
22B	14143-5	Switch Actuator, Long (-002 only)	-
23	18212	Exit Switch Mounting Bracket	1
24	9453-20	Screw, No. 6-32x1/8"	2
25	9453-107	Screw, No. 2-56x5/16"	2
26	9453-16	Screw, No. 6-32x5/8"	4
27	17958-94	Motor and Wire Assembly	1
28	18214	Motor (Less wire assembly)	-
29	9971-3	Lockwasher, No. 6	2
30	9973-3	Hex Nut, No. 6	2
31	18201-1	Worm (Steel), Motor	1
32	9453-91	Screw, Set No. 2-56x1/8" RHSM	1
33	18218	Electrical Connector Mtg. Bkt.	1
34	9481-1	Screw, No. 6-32x3/16" RHSM SEMS	2
35	17147-4	Transformer (115 VAC units only - less wire assembly)	1
36	8804-260	Spacer	2
37	9482-25	Screw, No. 6-32x1 3/4" THSM	2
38	18217	Bracket, Relay	1
39	17397-1	Socket, Relay	1-3
40	18250	Retainer, Socket	1-3
41	15401-5	Electrical Connector (9-pin)	1
42	15210-7	Electrical Connector (12-pin)	2
43	9482-2	Screw, No. 6-32x1/8" THSM	2
44	16431-1	Relay (24VDC)	1-3
45	2389-6	Retainer, Relay	1-3
46	18231	Cover, Top	1
47	9453-63	Screw, No. 4-36x1 1/8" RHSM	4
48	8804-259	Insulator, Short	4
49	8804-258	Insulator, Long	4
50	18237-2	Power PCB (All units except -009 or -005 with serial nos. of 07 or greater as the last two digits)	1
50A	18237-3	Power PCB (For -009 only - escrow)	-
50B	18237-5	Power PCB (Only for -005's with serial nos. having a no. of 07 or greater as the last two digits)	-
51	18239-2	Logic PCB (All units)	1
52	9971-2	Lockwasher, No. 4	4
53	9973-3	Nut, Hex - No. 4-36	4
54	18311	Unlatching Cam	1
55	18228	Cover, Platen (For -000, 005, 006, 007, 009, 010 & 012)	1
55A	18228-1	Cover, Platen (-008 only)	-
55B	18228-2	Cover, Platen (-004 & -011 only)	-
55C	18228-3	Cover, Platen (-002 only)	-
55D	18228-4	Cover, Platen (-003 only)	-
56	9453-91	Screw, No. 2-56x1/8" RHSM	4
57	9482-2	Screw, No. 6-32x1/8" THSM	4
58	18226	Guide, Bill (for horiz. mount units with two screws holding head bracket)	1
58A	18226-1	Guide, Bill (for vertical mount units with two screws holding head bracket)	1
58B	18226-2	Guide, Bill (for horizontal mount units with three screws holding head brackets)	-
58C	18226-3	Guide, Bill (for vertical mount units with three screws holding head brackets)	-
59	8773-40	Washer, No. 6	2
60	18227-1	Bracket, Scan Head (for both heads)	1
60A	18227-2	Bracket, Front Scan Head (frt. hd. only)	-
60B	18227-3	Bracket, Rear Scan Head (rear hd. only)	-
61	9453-8	Screw, No. 4-36x1/8" RHSM	2-3
62	9994	Springrip Washer	2-3
63	17958-92	Coax Wire Assembly (for both heads	1
64	17136	Head, Magnetic Scanning (with screws)	2
65	18233-3	Printed Circuit Board and Cover Assembly (both boards, for all units except -005 with a SN having a no. of 07 or greater as the last two digits and -009)	1
65A	18233-4	Printed Circuit Board and Cover Assembly (both boards, for -009 units only)	-
65B	18233-6	Printed Circuit Board and Cover Assembly (both boards, for -005 only with SN's having a no. of 07 or greater as the last two digits)	-

PLATEN ASSEMBLY

Parts List; Refer to Figure 4

Index No.	Part No.	Description	Quantity
1	18316	Platen (Includes 4 staked pins, for -000, -003, 005, 006, 007, 009, 010 & 012)	1
1A	18316-1	Platen (Includes 4 staked pins, for -002, 008 & -011)	-
1B	18316-2	Platen (Includes 4 staked pins, for -004 only)	-
2	18222	Arm Assembly, Scan Head Roller	2
3	8792-42	Shaft, Roller Arm	1
4	8974-3	Spring, Roller Arm	1
5	8804-261	Roller, Head	2
6	8959-8	Ring, Retaining	10
7	18240	Spring, Drive Pressure Roller	6
7A	18240-1	Spring, Drive Pressure Roller (Replace two of springs shown as Index 7)	-
8	18241	Roller, Drive Pressure	6
9	18224	Bar, Latch	2
10	8987-3	Spring, Latch Bar	1
11	8792-44	Shaft, Platen Pivot	1

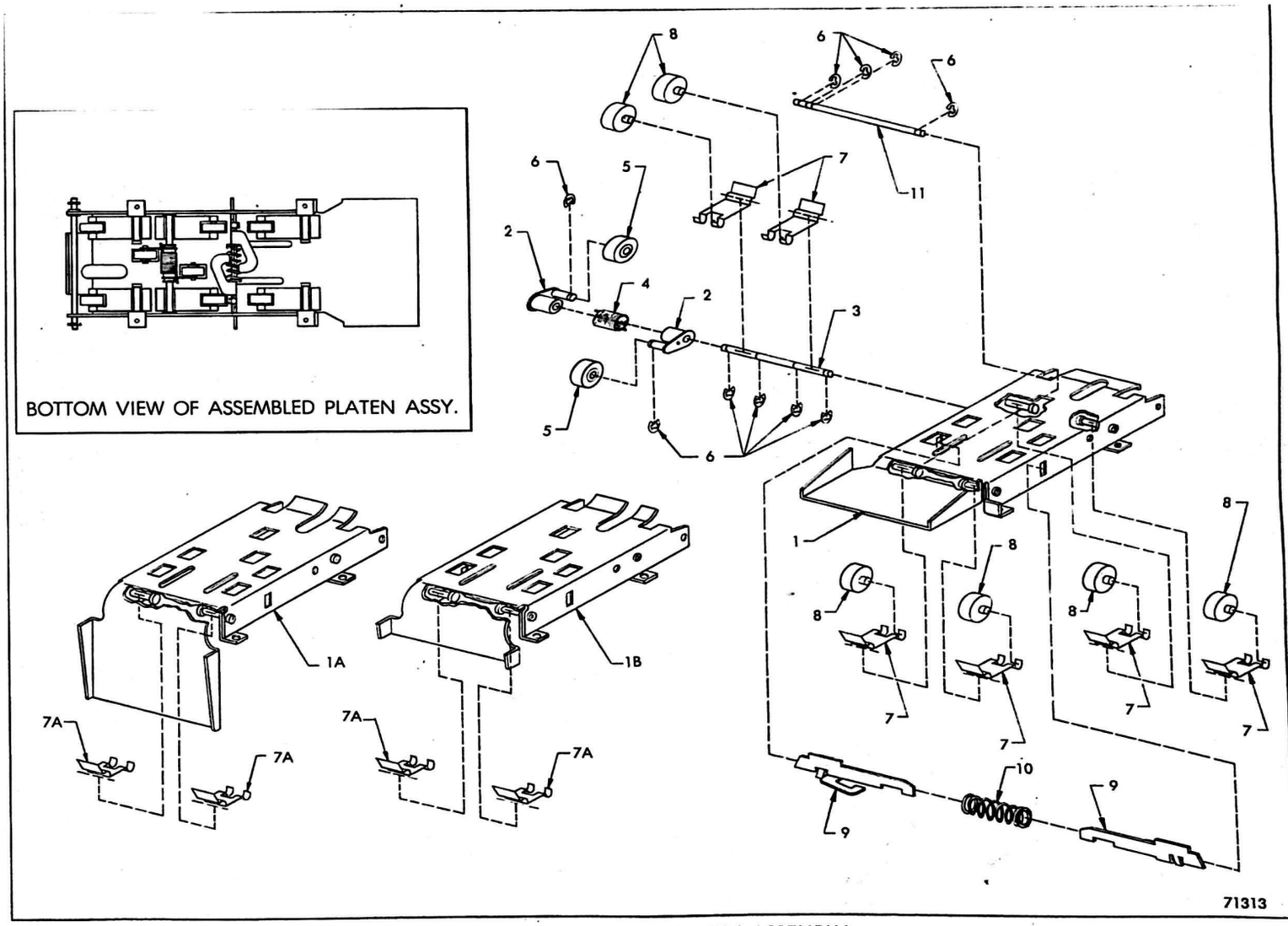


FIGURE 4, 34-04-XXX PLATEN ASSEMBLY

SIDE PANELS

Parts List; Refer to Figure 5

Validator Model No.	Left Side Panel Part No.	Right Side Panel Part No.	Connector Location	Validator Model No.	Left Side Panel Part No.	Right Side Panel Part No.	Connector Location
34-04-000	18229	18229-1	Rear, Next to Right Side	34-04-007	18229	18229-1	Rear, Next to Right Side
34-04-002	18301-2	18300-1	Right Side, Next to Front	34-04-008	18301-2	18300-1	Right Side, Next to Front
34-04-003	18229	18229-1	Rear, Next to Right Side	34-04-009	18229	18229-1	Rear, Next to Right Side
34-04-004	18301-1	18300-2	Left Side, Center	34-04-010	18229	18229-1	Rear, Next to Right Side
34-04-005	18229	18229-1	Rear, Next to Right Side	34-04-011	18301-1	18300-2	Left Side, Center
34-04-006	18229-1	18229-2	Right Side, Next to Rear	34-04-012	18229	18229-1	Rear, Next to Right Side

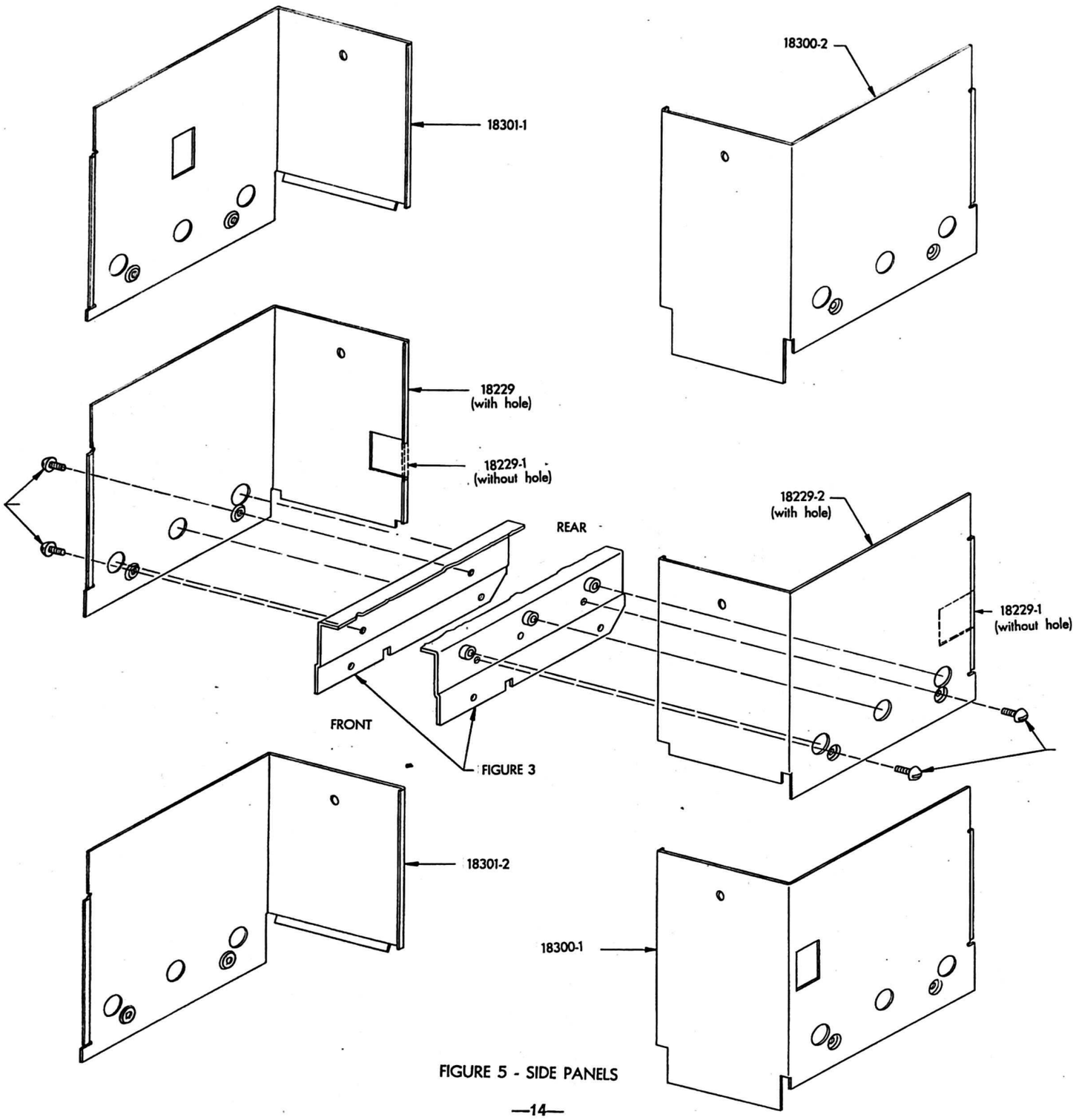


FIGURE 5 - SIDE PANELS

NRI'S 34-04-XXX SERIES BILL VALIDATOR

FUNCTIONAL TEST PROCEDURE

1. Test all horizontal mount units with mounting brackets attached to sides (weight of unit not supported by platen). This permits the insertion snout to float or have some free up-down movement. Brackets not required for vertical mount units.

2.. Bill exit area must be clear to allow an accepted bill to freely exit unit.

3.. Validator must have been at room ambient temperature (within 40°F.-140°F.) for at least 30 minutes prior to testing.

4.. The Power Source should be capable of maintaining the following voltage potentials and current flows for the validator.

   A. 115 VAC — nominal — (97-127 VAC) and must provide 2 amps maximum.

   B. 24 VAC — nominal — (22-27 VAC) and must provide 6 amps maximum.

   Test all units at the applicable nominal voltage as defined above (i. e. 24 VAC units at 24 VAC).

5. Electrical schematics for the test box are as shown on the unit schematics. Standard test harnesses are available from NRI. The 115 VAC units, excluding the -001, -002 and -009, can be tested with tester model 12-02-082. The 24 VAC units can be tested with tester model 12-02-083. The testers should have the green wire secured to earth ground.

   CAUTION — DO NOT PLUG 24 VAC UNITS INTO A 115 VAC SOURCE.

6. Connect tester to the validator and power source.

7. Open Platen Assembly to expose the switches and scanning heads.

   A. Place the Start (Front) Switch to N. O. — the motor must run forward.

   B. Keeping the Start Switch to N. O. the motor must turn — off within 3 to 60 seconds. (Timed sequence T3). Release the Start Switch to N. C.

   C. Place the Sequence (middle) Switch to N. O. — the motor must run in the reverse direction. Release the Sequence Switch to N. C.

   D. Place the Exit (rear) Switch to N. O. — the motor must run in the reverse direction. Release the Exit Switch to N. C.

   E. Place the Start Switch and then the Sequence Switch to N. O. — the motor must start forward and reverse within ¾ of 1 second after placing the Sequence Switch to N. O. (Timed sequence T1).

   F. All switchs released (N. C.) — place Start, then Sequence, and then Exit Switches to N. O. and the motor must start forward and reverse within ½ of one second after the Exit Switch was actuated to N. O. The actuation of the Sequence and then the Exit Switch must have occurred within ¾ of 1 second to check this position.

   G. Switch actuators, pressure rollers and belts **must not** drag on openings in bill guide or platen.

8. With Platen Assembly closed:

   A. Insert any bill green side next to the Frame Assembly, at least five times — the rejects must be 100%.

   B. Insert other denominations of U.S. Currency with black side next to the Frame Assembly — should reject denominations other than U.S. $1 bills.

   C. Insert 15 different U.S. $1 bills in fair to new condition (not poor or bad) as follows. First insert the 15 bills with black side next to frame and with the top of the head in the portrait to the right. Count the number of rejects. Secondly, insert the 15 bills black side next to the frame with the head to the left. Count the number of rejects. Total rejects from above (head to right and left) must not exceed three (3) . Should the rejects exceed three (3) insert each one again and the total rejected must be three (3) or less. If not, acceptance rate is poor and the optimizing of adjustments may be required to correct this condition.

      Should there by any doubt as to the validity of the test data repeat the test with different bills as test samples. The use of badly creased and/or tattered bills as test samples can lead to erroneous conclusions.

   D. Escrow Units Only — The same test criterion as defined above is applicable. However, the bill must always stop in the escrow position (trailing edge of bill between the Sequence and Exit Switches) once validated. At this point the bill must be returned or accepted 100% of the time if the CANCEL SALE or SELECTION button is pushed, respectively.

MOTOR SPEED CONTROL

GENERAL:

The validation of a valid bill depends upon the speed at which it moves beneath the fixed scanning heads. Each unit is factory adjusted to regulate the speed of the moving bill to a known value in "inches per second". This value corresponds to the center frequency of the tuned circuitry for the scanning heads. Factory adjusting of the motor speed potentiometer, figure 6, to a given logic board and frame and platen assembly optimizes total bill acceptance throughout the temperature range of 40°F. through 140°F. This setting should remain valid for any unit provided the motor or power board is not changed.

The potentiometer (POT) setting **should not be changed** to compensate for drive train problems. Prior to changing the POT setting refer to the drive train adjustment procedure.

ADJUSTING: (Refer to Figure 6)

To adjust a questionable POT setting, perform the following steps:

1. Precisely mark the original or factory setting prior to moving the pin of the POT.
2. Rotate the POT to its extreme clockwise (CW) position and note a change in the motor speed when inserting a bill.
3. Slowly rotate the POT, in very small increments, counter-clockwise (CCW) and insert a bill at least three times after each change. Continue this sequence until the bill is occasionally accepted. Precisely mark the pin position at this point.
4. Rotate the POT to its extreme CCW position. Insert a bill and note a change of motor speed. Repeat the sequence performed in step 3 except rotate the POT CW until the bill is occasionally accepted.
5. Set the movable pin of the POT exactly to the center of the distance between the two marks obtained in steps 3 and 4. Normally this final setting is close to the original factory setting.

The motor speed control circuitry is now set to function for optimum bill acceptance at the existing ambient temperature conditions.

The final criterion for this POT setting must be performance of and passing the Functional Test Procedure contained within this manual.

Should it not be possible to perform any of the above steps reset the POT to its original setting and refer to the trouble chart.

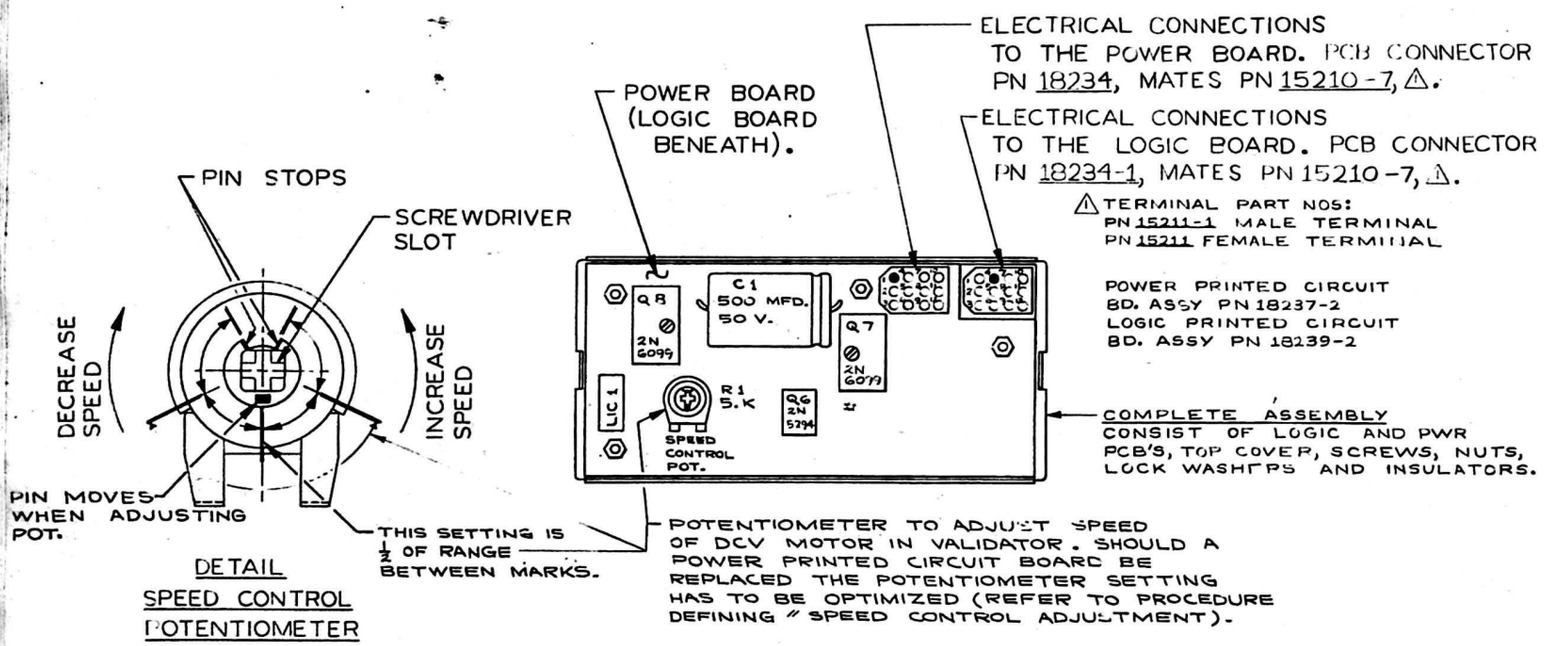

ELECTRICAL CONNECTIONS TO THE POWER BOARD. PCB CONNECTOR PN 18234, MATES PN 15210-7, ⚠.
POWER BOARD (LOGIC BOARD BENEATH).
ELECTRICAL CONNECTIONS TO THE LOGIC BOARD. PCB CONNECTOR PN 18234-1, MATES PN 15210-7, ⚠.
⚠ TERMINAL PART NOS: PN 15211-1 MALE TERMINAL PN 15211 FEMALE TERMINAL
PIN STOPS
SCREWDRIVER SLOT
DECREASE SPEED
INCREASE SPEED
Q8 2N6099
C1 500 MFD. 50 V.
Q7 2N6079
LIC 1
R1 5.K
Q6 2N5794
SPEED CONTROL POT.
POWER PRINTED CIRCUIT BD. ASSY PN 18237-2
LOGIC PRINTED CIRCUIT BD. ASSY PN 18239-2
COMPLETE ASSEMBLY CONSIST OF LOGIC AND PWR PCB'S, TOP COVER, SCREWS, NUTS, LOCK WASHERS AND INSULATORS.
PIN MOVES WHEN ADJUSTING POT.
THIS SETTING IS ½ OF RANGE BETWEEN MARKS.
POTENTIOMETER TO ADJUST SPEED OF DCV MOTOR IN VALIDATOR. SHOULD A POWER PRINTED CIRCUIT BOARD BE REPLACED THE POTENTIOMETER SETTING HAS TO BE OPTIMIZED (REFER TO PROCEDURE DEFINING " SPEED CONTROL ADJUSTMENT).
DETAIL SPEED CONTROL POTENTIOMETER

FIGURE 6 - MOTOR SPEED ADJUSTMENT

:

scanning heads have an air gap or window across e scanning element (see figures 7 and 7A). Normally ow iis very difficult to see by observing without the maggnifying glass.

ow iis precisely factory aligned to be parallel with the e of the pressure roller that contacts each head.

lacing the scanning heads or related components the f the head may require alignment to the center-line essure roller.

NT:

ove the platen cover to expose the pressure rollers.

thee platen assembly open, place a piece of tape (i. e. ch Magic Transparent) over both heads.

r the area over and around the active element of each with a coat of ink from a felt-tip pen. Permit the o dry.

e the platen assembly to its normal position.

ly rotate the pressure roller over each head by turn- thee roller toward the insert opening (rear to front on.). The objective being to simulate a bill moving nor- under the heads. The rollers will each make a wear rn in the ink placed over the heads.

6. The wear pattern should be parallel and in the center of an imaginary center line (side-to-side) of the active scanning element.

   Malformed scanning head control arms or rolls can cause an uneven wear pattern. Should this occur the defective part must be properly reformed and aligned or replaced.

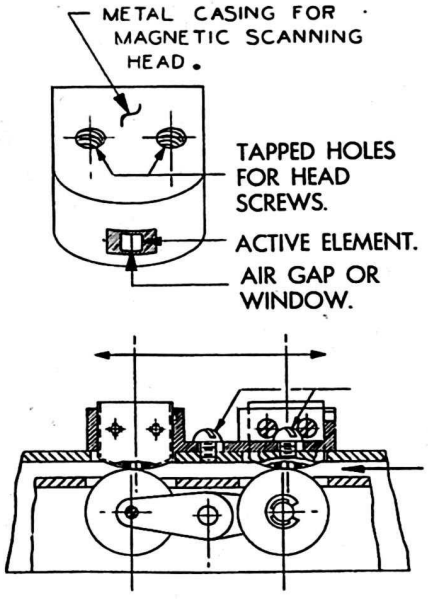
7. The scanning heads are adjustable. Under no circumstances should the metallic surface of the head touch the opening in the Bill Guide. The head bracket that holds both heads is basically adjustable front to back. The individual head brackets (secured via three in lieu of two screws) are basically adjustable such that they pivot the heads to permit the head and roller center-lines to be parallel.

8. The tape is removed to adjust the heads. Access to the retaining screws for the head bracket is obtained by removing the Bill Guide.

   CAUTION: Carefully route the coax head wire through the opening in the frame to prevent damage to the soldered connections at each head.

9. Optimum signal levels are obtained from a moving bill when the head and roller center-lines are parallel. Extension of this center-line to the sides of the Bill Guide should result in a perpendicular intersection.

   The final criterion for this head alignment must be the performance of and passing the functional test procedure contained within this manual.



RE 7 - SCAN HEAD TO PRESSURE ROLLER RELATIONSHIP (BOTH HEADS IN A COMMON MOUNTING BRACKET)

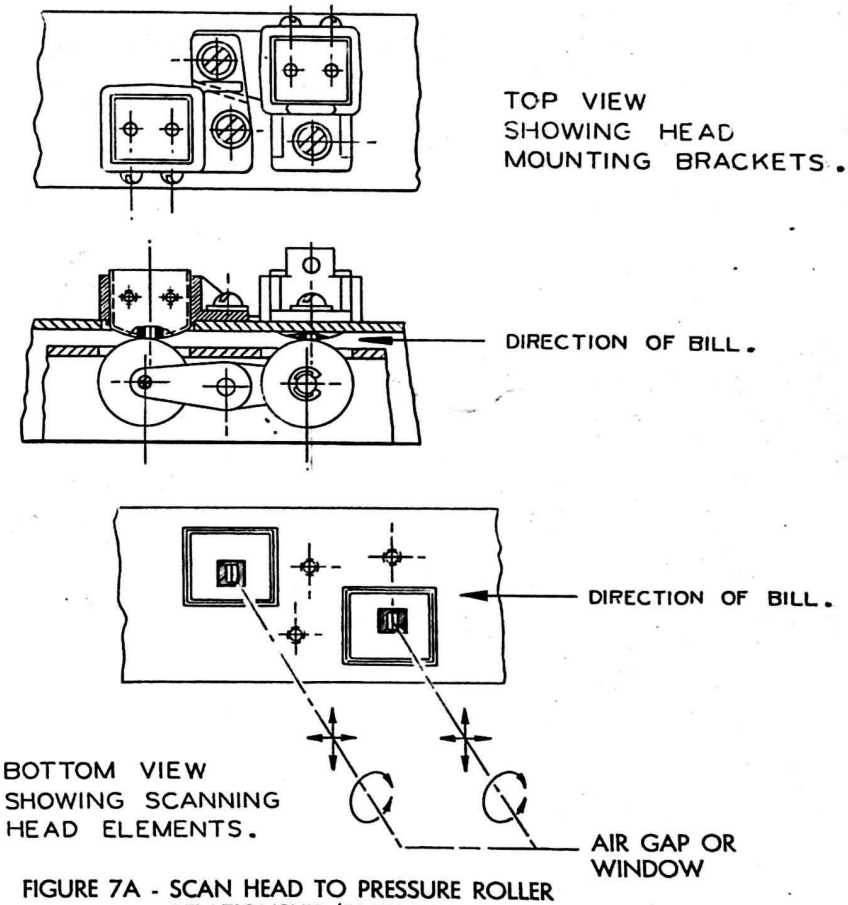

TOP VIEW SHOWING HEAD MOUNTING BRACKETS.
DIRECTION OF BILL.
DIRECTION OF BILL.
BOTTOM VIEW SHOWING SCANNING HEAD ELEMENTS.
AIR GAP OR WINDOW

FIGURE 7A - SCAN HEAD TO PRESSURE ROLLER RELATIONSHIP (EACH HEAD MOUNTED IN INDIVIDUAL MOUNTING BRACKETS)

DRIVE TRAIN FOR THE BUCKPASSER

INTRODUCTION

The drive train provides a quiet, smooth, continuous driving force for a bill. From the moment of insertion of a bill constant driving contact is maintained with the bill to insure jam-free bill movement. One plane of bill movement is obtained by utilizing a DIRECT CURRENT REVERSIBLE MOTOR (PERMANENT MAGNET). The driving force was purposely designed to be soft, meaning that some slippage when handling certain undesirable bills is essential. The reason that slippage is desirable is to prevent bill jams of a nature that **cannot** be retrieved by the using customer, otherwise the jam would require a service call.

Since validation of a valid bill depends upon the speed of its movement the rotating speed of the drive belts is regulated. This is accomplished by monitoring the tachometer output of the motor. The tachometer signal is applied to the motor speed regulating circuitry on the power printed circuit board. Thus, the belt speed is increased or decreased contingent on the load that the drive train encounters as the bill is pulled through the bill movement path.

The components included in the drive train are as follows. Basic function for each component is also listed.

A. MOTOR & MOTOR WORM — provides the driving force, of the required speed, to the drive shaft. The force is provided in a forward or reverse direction.

B. DRIVE SHAFT ASSEMBLY — consists of the drive shaft, retaining ring, spacer, two drive pulleys with set screws and the worm gear with set screw. Its purpose is to transmit the driving force from the Motor Worm to the Drive Belts. The belts will rotate in a forward or reverse direction as determined by the rotational direction of the Motor Worm.

C. DRIVE BELTS AND ROLLERS — There are two drive belts with each installed over a drive pulley and two Idler Rollers. Each idler roller is secured on its shaft, that is staked to the frame, by a retaining ring. Directly over each Idler Roller and Drive Pulley is a drive pressure roller. The drive pressure rollers are located in the platen opposite the bill guide. Each roller has its individual leaf spring (6 total) to constantly hold it firmly against the drive belts.

ADJUSTMENTS

MOTOR AND MOTOR WORM — To remove and/or install the motor the Bill Guide is removed. Prior to performing this step remove the side panels and disconnect the printed circuit board assembly. The bill guide is now easily removed by opening the platen and removing the four (4) screws that hold it to the frame.

CAUTION — As the bill guide is pulled away from the frame care should be taken to prevent pulling the wires loose on the scanning heads. This is easily accomplished if the coax wiring that connects to each head is routed through the frame opening to prevent a direct pulling force on the wire terminals of the heads. Magnetic Scanning Heads are delicate components and are easily damaged by physical abuse to the wire termination area.

When installing the motor after removal, hold it to its most forward position (toward snout) while firmly securing the two retaining nuts. It is important that the screw securing the Exit Switch mounting bracket does cock or tilt motor to one side due to excessive screw length. Secure the worm to the shaft of the motor as shown in Figure 8A. Tighten the set screw for the worm firmly.

DRIVE SHAFT ASSEMBLY — The side-to-side play in the drive shaft is set only after the bill guide is installed and firmly secured. With the shaft held to its "retaining ring side" the two drive pulleys are approximately centered in their openings in the bill guide. Holding the shaft to the retaining ring side eliminates side play in that direction. Firmly tighten the pulley next to the retaining ring to the center of its guide opening. The pulley next to the spacer should now be located such that the side-to-side play is as shown in figure 8B. This adjustment is performed with the Worm Gear loose and slid toward the spacer side of the drive shaft. Upon completion of this adjustment, close the platen, and turn the drive belts by hand. Rotate the belts at the rear opening and feel for excess friction, burrs, or any apparent obstruction to smooth friction-free rotation. Proper function of the drive pressure rollers should be observed at this point (i. e. excess drag, etc.).

The Worm Gear should now be checked for proper mesh with the teeth of the worm. Slide the Worm Gear to a point whereby the center of its teeth are in alignment with the center of the worm. Firmly hold the worm down toward the motor to eliminate end play of the motor's shaft. The Worm Gear should now have **some** axial (rotational) play. Check the Worm Gear play every 90° (four points) by sliding to side, away from worm, rotating 90° and realigning with worm and repeating the check. Misalignment of the centers is permissible as is shown in figure 8C. A bind condition, wherein the teeth do not mesh freely when sliding the Worm Gear side-to-side or no axial play, is not permissible. The set screw for the worm gear is to be firmly tightened to the **flat** on the drive shaft.

Cleaning and lubrication instructions should be performed in accordance with the instructions contained in this manual.

Minute adjustment changes may be required to eliminate excessive audible gear train noise.

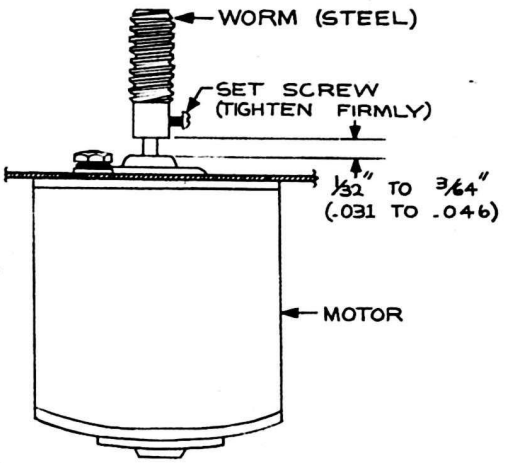


FIG. 8A - CUTAWAY VIEW OF MOTOR AND WORM

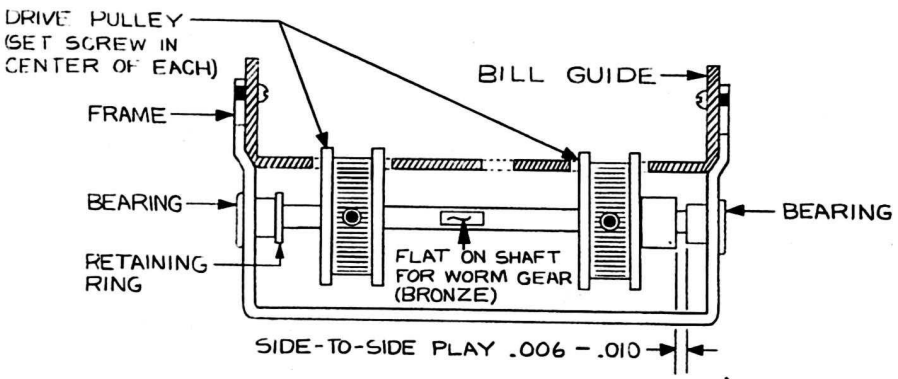


FIG. 8B - CUTAWAY VIEW OF DRIVE SHAFT TO SHOW SIDE-TO-SIDE PLAY (Motor, Worm, Worm Gear & Drive Belts Omitted for Clarity Only)

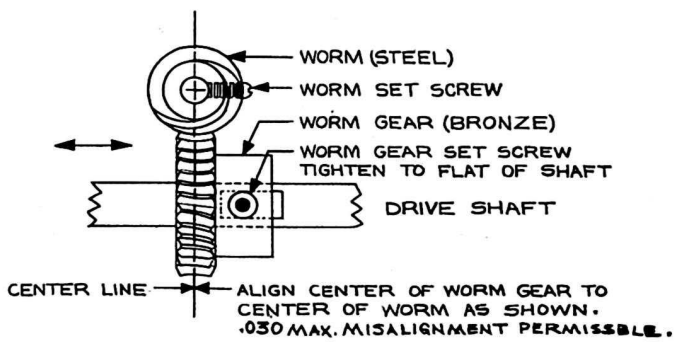


FIG. 8C - WORM GEAR TO WORM ALIGNMENT (Refer to Drive Train Adjustment Procedure)

CLEANING AND LUBRICATION

Optimum longevity will be realized out of your National currency validator if you give it periodic preventative maintenance. The environmental conditions and frequency of transactions of your specific locations will largely determine the intervals of cleaning and accumulation. Use of the various NRI Cleaners and Lubricants are recommended to insure complete compatibility of materials. For the best results, points that are to be lubricated should first be cleaned . . . Do not use excessive amounts of lubricants.

CLEANING

Contingent on debris to be removed use NRI Spray Cleaner No. 12644 (16 oz. can) or warm water and mild detergent with clean, lint free shop towels. Denatured alcohol is excellent for the scanning heads and drive belts.

LUBRICATION

1. For Drive Pressure Rollers pivot points (6 rollers, 2 points each) use Vaseline, or Dow Corning DC-4 (sparingly).

2. For Motor Worm and Worm Gear use very light coat of Vaseline, or Dow Corning DC-4, or Shell No. 5242 Darina Grease 2, or Melolube No. 62-B.

3. For Oilite Bearings, one in each rotor cap of the motor and two in frame for the drive shaft, use NRI Special Lightweight Oil No. 4959, or Singer Sewing Machine Oil.

SERVICE NOTATIONS

Fuze .7A slo blo

TROUBLESHOOTING GUIDE

The purpose of this section of the manual is to provide adequate information for recognizing, isolating and resolving a problem in the Buckpasser.

The validator was designed for serviceability, hence the wiring and electromechanical components can easily be checked for continuity without cutting or soldering wires. Obviously continuity measurements are made by using an ohmmeter. Most all VOM's (VOLT-OHM-METERS) have sufficient voltage and resistance scales to accomplish this. VOM's should have input impedance of no less than 20,000 OHMs per VDC and 5,000 OHMs per VAC. The VOM should be calibrated accurately. Details of the electromechanical components, relative to voltage and resistance readings with point-to-point wiring, are provided on the applicable electrical schematics for each unit. These details include such information as wire colors, point-to-point connections for each wire and typical resistance and voltage values for all components not contained within the printed circuit boards.

Proper utilization of the unit schematic and the troubleshooting chart contained in this section should result in isolating the problem to an electromechanical component, wiring, or the Logic or Power Printed Circuit Boards (PCB). In either of these cases the problem can be resolved by replacing the defective component, repairing the wiring, or replacing the bad board.

To isolate the problem to one of the two PCB boards it is necessary to use a VOM unless you have a spare set of good boards. The most expediate method of determining the condition of a PCB suspected as being defective, is to replace it with a known good one. The motor speed adjustment has to be reset whenever replacing a power PCB. The voltage measurements that should be observed at the electrical disconnects to the PCB's are as shown on the unit schematics. Reference to the section of the manual detailing sequence of operation will clarify when the various signal levels should or should not appear.

In cases where one of the Printed Circuit Boards is bad the defective board should be returned to the nearest NRI Sales and Service Center for replacement.

Contact your closest NRI Sales and Service Center or Factory Authorized Service Center for test equipment; replacement units and parts; packaging materials specifically designed for the validator; expert service by factory trained servicemen or any other appropriate matter that NRI can be of assistance with.

Packing Materials:

1. Validator Box		**NRI Part Nos.**
Inner Paks (2 pc.)	-	Side 448-077 (20-3/8" x 9-1/4")
	-	Top 448-076 (20-7/8" x 6-5/8")
Outer Pak (1 pc.)	-	448-075
2. PCB Box		
Inner Pak (1 pc.)	-	449-024 (8" x 14" x 1")
Outer Pak (1 pc.)	-	449-023

FOREWORD

The symptoms and corrective steps listed in the troubleshooting chart are applicable to only one possible failure per step. Multiple failure symptoms are not covered. For all listed symptoms it is assumed that the electrical wiring connections between all points are good (i. e. approximately zero OHMs and not shorted to other electrical paths). Component failures such as switches, transformers, motors and relays are covered in the chart.

N.O. normal open
N.C. closed

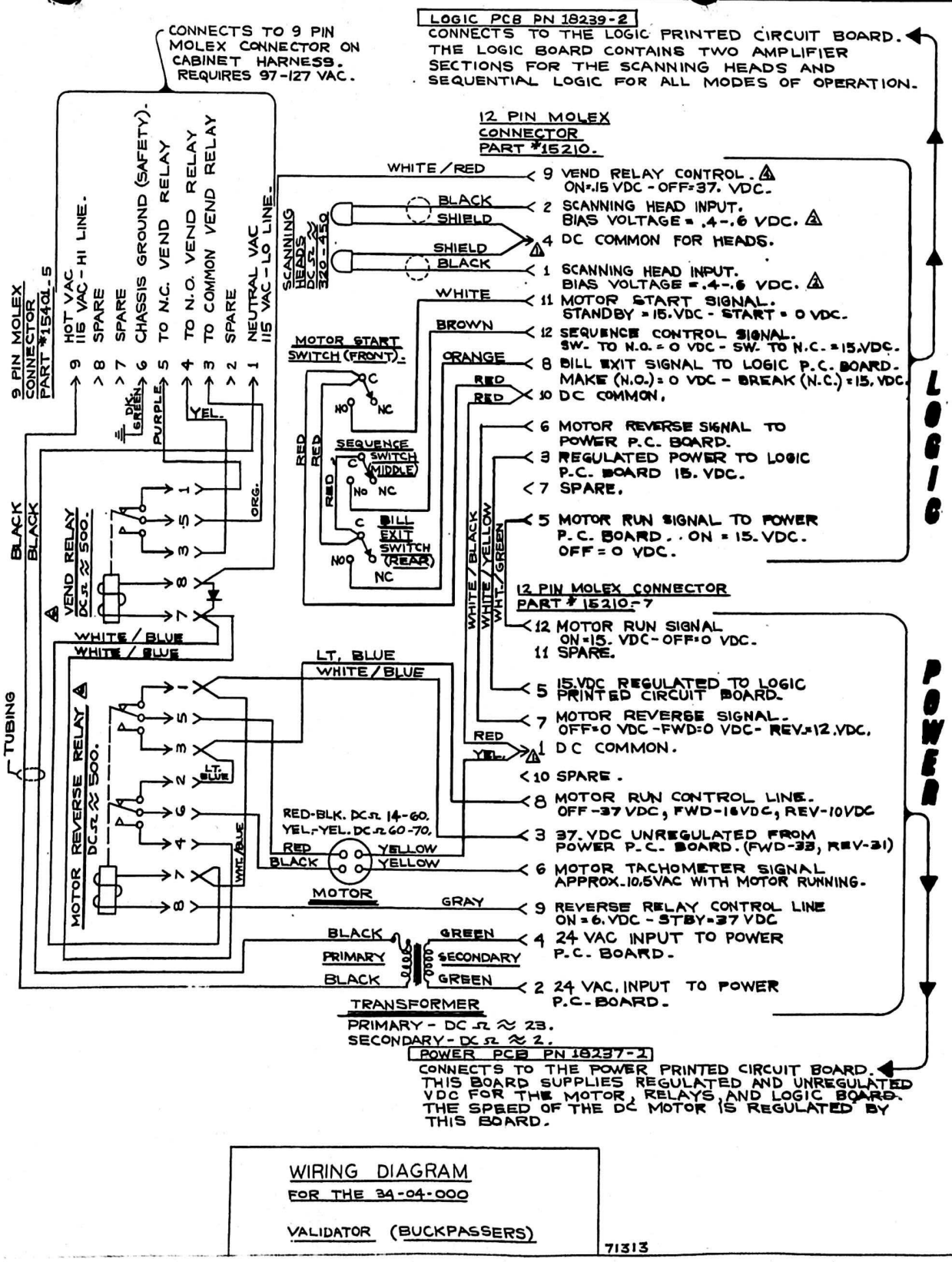
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
(1) Motor does not run in either direction (does not try to turn; observe shaft of rotor). (Presuming that tester and validator are properly connected to AC facility power.)	*(1A) One of three (3) bill controlled switches in N. O. (actuated) position. This allows overall time sequence T3 to expire and keep motor off. The motor should re-start and T3 shutoff should occur if unit is unplugged and plugged back in.*	(1A) If either of the switch actuators are dragging opening adjust switch bracket and/or replace switch actuator. Replace switch if failed internally.
	(1B) Reverse Relay not plugged into socket or loose.	(1B) Firmly push relay into socket and install relay retainer clip, if missing.
	(1C) No input power to validator from facility power source or transformer (i.e. normal sources are all fused similar to the X-Changer currency changer).	(1C) Check pins 2 & 4 of power PCB for 22-27 VAC. If no reading the transformer is bad or facility power is off. Replace transformer (or fuse in primary) or turn facility power on. If XFMR is bad check power PCB for a high continuity reading (nlt 1 Meg OHM) from pin 8 to 1. The VOM leads may have to be reversed to obtain reading. Power Board must be unplugged. Replace board if reading is low both ways.
	(1D) Regulated +15VDC and/or unregulated +37VDC from power board not present.	(1D) Check power PCB pin 3 to 1 for +37VDC unregulated and power PCB pin 5 to 1 for +15VDC regulated. If either is zero volts and step 1C is OK replace the power PCB.
	(1E) The motor run signal from the logic PCB is not applied to power PCB.	(1E) Check power PCB pin 12 to 1 for 15 VDC by actuating any two switches to it's N. O. position. If reading is zero replace the logic PCB.
	(1F) The circuit to the motor windings are open or shorted out.	(1F) Check with ohmmeter by disconnecting power PCB and checking harness power connector pin 3 to 8 and to chassis. If open or shorted (less than 12 ohms) replace motor.
	(1G) Should the drive train (motor, worm, worm gear or drive shaft) be too tight or loose the rotor may appear not to move at all but the motor is consuming electrical power.	(1G) Refer to and perform adjustment procedure on page 18-19. Pin 8 to 1 of power PCB should change from 37 VDC to approximately 20 VDC if motor is trying to start but stalled due to jammed drive train.
(2) Motor runs in forward direction at all times. (All switches are in their N. C. positions.)	*(2A) Defective power PCB — Normally the motor will be running very slow. However, the speed can be from slow to fast.*	(2A) Check pin 12 to 1 of power board. Reading should be 0 VDC. If reading is 15 VDC the logic board is at fault. Check power board pin 8 to 1, if reading is approximately 16 VDC the power board is defective and should be replaced.
	(2B) Logic Board defective — the motor will run forward at normal speed until T3 time delay turns motor off. Unplug connector on outside of unit and reconnect and the above sequence repeats itself.	(2B) Check pin 12 to 1 of power board. If reading is 15 VDC replace the logic board.
(3) Motor runs in forward direction when the sequence or exit switch is actuated (actuating any of the three switches runs the motor forward).	*(3A) Coil of reverse relay open.*	(3A) Replace reverse relay.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
(3) Cont.,	*(3B) Reverse relay contacts stuck or welded to their N. C. position.*	(3B) Replace reverse relay.
	(3C) Motor reverse signal not applied to power PCB from logic PCB or power board not energizing reverse relay.	(3C) Check power PCB pin 7 to 1 for 12 VDC when making the sequence or the exit switches only. If reading remains zero the logic PCB is bad. If reading is correct the power PCB is bad.
(4) Motor runs in the reverse direction when actuating the start switch. Also runs in reverse when actuating the sequence and exit switches as it should. Motor stops when either of the switches are released to N. C.	*(4A) Reverse relay contacts welded or stuck to the N. O. (energized) position. This would be obvious prior to plugging unit into power source.*	(4A) Replace the reverse relay.
	(4B) Reverse relay constantly energized as soon as unit is plugged into power source.	(4B) Check for 12 VDC reading at power PCB pin 7 to 1. If reading is present with sequence and exit switches to N. C. the logic board is bad. Replace the logic board. If reading is zero volts the power PCB is bad if step 4A is not the problem. Replace the power PCB.
(5) Movement speed of the bill appears abnormal (too slow or too fast or varying).	*(5A) Motor speed control POT (potientiometer) on power PCB not adjusted properly. The POT adjustment can cause the belts to move too fast or too slow if improperly adjusted.*	(5A) Refer to adjustment procedure contained on Page 16.
	(5B) Drive belts dragging on bill guide or platen.	(5B) Adjust position of belt drive rollers equidistant in opening of bill guide. Belts could be stretched or cut — if so replace. Be sure that platen assembly is floating in its closed position when installed (horizontal mount units only). If not the tabs on the platen that control the minimum gap between it and the bill guide could be malformed — reform or replace.
	(5C) Drive train for belts not correctly installed or adjusted.	(5C) Refer to adjustment procedure for "worm, gear, drive pulleys and drive shaft" on Page 18-19. End to end play on motor rotor must not be so excessive as to cause bind between worm and worm gear — motor can be shimmed if extremely careful. Check for loose set screw in worm and worm gear. Check for loose nuts on motor mounting studs.
	(5D) The bill path has an obstruction of some type that either slows down the bill or the belts.	(5D) Check for burrs and correct if found. With platen assembly closed check pressure rollers for unobstructed movement. To accomplish this the platen cover must be removed. Check all switches actuators for correct form and movement and clearance in operative slots.
	(5E) Motor speed control circuit on power PCB board.	(5E) With the bill path unobstructed and the drive train functioning properly the motor speed POT should control the motor speed, thus controlling the speed of a moving bill. If not, replace power PCB.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
(5) Cont.,	*(5F) Tachometer output from motor zero or improper voltage. (Voltage should be approx. 9-13 VAC at power board pin 1 and 6 with motor running.)*	(5F) If power board is known to be good and other symptom 5 steps are not applicable, replace the motor.
(6) Timed sequence T1 (sequence switch to exit switch) does not function. All switches function normal. Actuation of the start and then the sequence switch does not cause motor reversal within ¾ seconds.	*(6) The T1 programmed time sequence circuitry on the logic board is defective.*	(6) Replace the logic board.
(7) Actuating the start sequence and exit switches to their N. O. positions (in that sequence) does cause the motor to reverse its direction of rotation. Each switch properly controls the motor when separately actuated.	*(7) The T2 programmed time sequence circuitry on the logic board is defective.*	(7) Replace the logic voard.
(8) Timed sequence T3 does not function. Motor does not stop running in 3 to 60 second period if you hold a switch in the N. O. position.	*(8) The T3 programmed time sequence circuitry on the power board is defective.*	(8) Replace the power board.
(9) Motor noise (audible) excessive. Some motor or gear train noise is normal and acceptable.	*(9A) Drive train mis-adjusted or loose.*	(9A) Refer to and perform adjustment procedure Page 18-19.
	(9B) Motor mounting nuts loose.	(9B) Tighten nuts.
	(9C) End-to-end play on rotor of motor excessive.	(9C) Shim or replace.
	(9D) Oilite bearings of motor require lubrication (one in each end cap).	(9D) Lubricate bearings very sparingly. Refer to Page 20 for instructions.
	(9E) Drive train requires lubrication.	(9E) Refer to Page 20 for instructions.
	(9F) Brushes (2) internal to motor not properly seated or aligned.	(9F) Correct seating by commercial seating compound or replace motor. Only complete motor assemblies are available from NRI.
(10) Bills or paper accepted when inserted with green side next to scanning heads and no vend signal.	*(10A) Reverse logic circuitry not functional.*	(10A) Check power PCB pin 7 to 1 for a 12 VDC reading when bill goes through unit. If reading is observed the logic board is functional, if not, replace the logic board.
	(10B) Reverse relay driver circuitry not functional.	(10B) Step 10A checks properly, now check power PCB pin 9 to 1 for the 37 VDC to change to 6 VDC and then back to 37 VDC. If observed power board o. k., if not replace power board.
	(10C) Reverse relay contacts remain in de-energized or N. C. position (possibly welded).	(10C) Replace relay.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
(11) Valid bills are always rejected when inserted with black side next to scanning heads. Other functions check normal.	*(11A) Motor speed not correct.*	(11A) Refer to and perform adjustment procedure on Page 16.
	(11B) Scanning heads coated with foreign matter (dirt).	(11B) Clean scanning heads (denatured alcohol or NRI cleaner). Use of water and a mild detergent is also acceptable; rinse and dry.
	(11C) Wire to scanning head broken or the internal head wiring open.	(11C) Disconnect logic board and check continuity of heads; logic board harness connector pins 1 and 2 to 4. Reading should be 320-450 ohms. Check continuity from pins 1, 2 and 4 to chassis of validator — reading should be infinity (very high ohm reading) or no connection whatsoever. If a reading to chassis is observed check for a shorted wire on the coax cable to heads. With logic board connected and power applied read .4-.6 VDC pins 1 and 2 to 4. If not observed look for bad connection. CAUTION — When removing bill guide to change a scanning head or repair a wire connection be very careful to prevent damage to the head or head connections. The wire connection and scanning head can be damaged if bill guide is carelessly removed. Free play or length of the coax head leads is a must when removing bill guide.
	(11D) Scanning head aircap in window of head not directly over center of pressure rollers (this gap is not normally observable via the naked eye).	(11D) Refer to and perform the adjustment procedure on Page 17.
	(11E) Logic board defective.	(11E) Replace logic board.
(12) Takes bills black side next to heads but does not give a vend signal. Rejects properly.	*(12A) Logic board not energizing the vend relay due to defective logic board.*	(12A) Unplug vend relay. Check for momentary continuity reading on VOM from logic board pin 9 to 4 (i. e. Simpson 260 momentarily deflects to about 1,000 ohms on RX100 scale with red wire on pin 9 and black wire on pin 4. If deflection is not observed replace the logic board. If deflection is observed go to next step.
	(12B) Vend relay defective or loose in socket.	(12B) Replace vend relay or firmly push relay in socket and latch in place with retainer clip.
(13) Vend signal remains on constantly. Bills reject properly and appear to accept properly except the vend light is constantly illuminated.	*(13A) Vend relay defective — Contacts stuck or welded to N. O. position.*	(13A) Replace defective relay.
	(13B) Logic board defective.	(13B) Replace defective logic board.
(14) Takes paper and gives a vend signal.	*(14A) Defective logic board — noise levels transmitted to board sufficient to latch validation circuitry.*	(14A) Replace defective logic board.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
(14) Cont.,	*(14B) Earth ground not connected.*	(14B) The unit should be connected to earth ground through Pin No. 6 of connector in vendor that plugs into validator.
(15) Vend signal duration too short. Not properly energizing the credit system with which it is electrically interfaced (connected to).	*(15) Defective logic board.*	(15) Replace defective logic board.
(16) Vend signal too long in duration.	*(16A) Defective logic board.*	(16A) Replace defective logic board.
	(16B) Vend relay has excessive residual magnetism.	(16B) Replace the vend relay.
(17) Poor acceptance rate. Determined by functional test procedure on Page 15. All other functions are normal.	*(17A) Drive train improperly installed or adjusted including drive belts dragging on bill guide or platen.*	(17A) Refer to and perform adjustment procedure on Page 18-19.
	(17B) Drive Pressure Rollers in platen assembly not turning freely when bill moves through unit or tension springs too weak.	(17B) Look for burrs, etc. and correct. Replace weak or malformed springs.
	(17C) Scanning Head Pressure Rollers cocked or sitting toward sides of heads. Tension springs weak.	(17C) Reform Head Pressure Roller Arm or replace. Wear tension springs should be replaced.
	(17D) POT for motor speed improperly adjusted.	(17D) Refer to and perform adjustment procedure on Page 16.
	(17E) Scanning head positions not over center of pressure roller.	(17E) Refer to and perform adjustment procedure on Page 17.
	(17F) Coax wiring leads for heads may have bare wire touching metal	(17F) Re-route coax wire and install insulation over exposed leads.
	(17G) Defective logic board.	(17G) Replace defective logic board.
(18) Insertion of a bill does not start motor. With platen open the actuating of sequence and exit switches run motor in reverse direction.	*(18) Start switch stuck or failed in N. C. position.*	(18) Correct obstruction or replace switch.
(19) Rejects all bills. Motor does not run in reverse direction when sequence or exit switch is actuated to N. O. with platen open.	*(19A) Sequence switch stuck or failed in N. C. position.*	(19A) Correct obstruction or replace switch.
	(19B) Exit switch stuck or failed in N. C. position.	(19B) Correct obstruction or replace switch.


CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 97-127 VAC.
LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
12 PIN MOLEX CONNECTOR PART #15210.
9 PIN MOLEX CONNECTOR PART #1540L-5
9 HOT VAC 115 VAC - HI LINE.
8 SPARE
7 SPARE
6 CHASSIS GROUND (SAFETY).
5 TO N.C. VEND RELAY
4 TO N.O. VEND RELAY
3 TO COMMON VEND RELAY
2 SPARE
1 NEUTRAL VAC 115 VAC - LO LINE.
SCANNING HEADS DC Ω ≈ 320 - 450
WHITE/RED 9 VEND RELAY CONTROL. ⚠ ON=.15 VDC - OFF=37. VDC.
BLACK 2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4-.6 VDC. ⚠
SHIELD
SHIELD 4 DC COMMON FOR HEADS. ⚠
BLACK 1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4-.6 VDC. ⚠
WHITE 11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
RED 10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD. . ON = 15. VDC. OFF = 0 VDC.
MOTOR START SWITCH (FRONT).
SEQUENCE SWITCH MIDDLE
BILL EXIT SWITCH (REAR)
NO NC C
LOGIC
12 PIN MOLEX CONNECTOR PART # 15210-7
12 MOTOR RUN SIGNAL ON=15. VDC - OFF=0 VDC.
11 SPARE.
5 15.VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF=0 VDC - FWD=0 VDC - REV.=12. VDC.
1 DC COMMON.
10 SPARE.
8 MOTOR RUN CONTROL LINE. OFF-37 VDC, FWD-16 VDC, REV-10 VDC
3 37. VDC UNREGULATED FROM POWER P.C. BOARD. (FWD-33, REV-31)
6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6. VDC - STBY = 37 VDC
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC. INPUT TO POWER P.C. BOARD.
POWER
VEND RELAY DC Ω ≈ 500
MOTOR REVERSE RELAY DC Ω ≈ 500.
BLACK
BLACK
TUBING
WHITE/BLUE
WHITE/BLUE
LT. BLUE
WHITE/BLUE
RED-BLK. DC Ω 14-60.
YEL.-YEL. DC Ω 60-70.
RED
BLACK
YELLOW
YELLOW
MOTOR
GRAY
BLACK
PRIMARY
BLACK
GREEN
SECONDARY
GREEN
TRANSFORMER
PRIMARY - DC Ω ≈ 23.
SECONDARY - DC Ω ≈ 2.
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD. THIS BOARD SUPPLIES REGULATED AND UNREGULATED VDC FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

NOTES

⚠ POLARIZING TERMINAL.

⚠ WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.

3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.

⚠ THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.

5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.

⚠ RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.

7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.

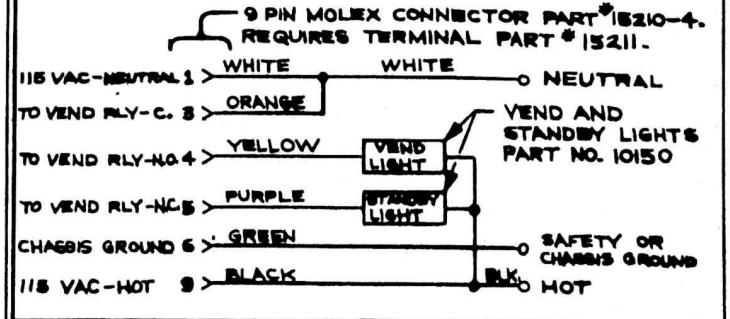
8 Y — TERMINAL PART # 15211.
↑ — TERMINAL PART # 15211-1.

GENERAL SPECIFICATIONS:

THIS UNIT IS DESIGNED FOR HORIZONTAL MOUNTING. STANDARD MOUNTING BRACKETS ARE SHIPPED WITH EACH UNIT.
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.
THE ELECTRICAL CONNECTOR IS ON THE REAR PANEL (TOP RT.)
POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP - 5. WATTS.
RUNNING: .45 AMP - 40. WATTS.
SURGE: 1.2 AMPS - * WATTS.
VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-000 ≈ 6 1/2 LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED 250 SECONDS IN DURATION.

TESTER SCHEMATIC



APPLICATION DATA SHEET FOR THE NRI BUCKPASSER BILL VALIDATOR MODEL NO. 34-04-000

WIRING DIAGRAM
FOR THE 34-04-000
VALIDATOR (BUCKPASSERS)

71313

NATIONAL REJECTORS INDUSTRIES
HOT SPRINGS, ARKANSAS, U.S.A. 71901

LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS REQUIRES 97-127 VAC.
9 PIN MOLEX CONNECTOR PART # 15401-5
9 HOT VAC 115 VAC - HI LINE
8 MOTOR DISABLE CIRCUIT. ⚠4
7 SPARE
6 CHASSIS GROUND (SAFETY).
5 DC COMMON ⚠
4 VEND SIGNAL (COLLECTOR OF Q 20). ⚠
3 SPARE
2 SPARE
1 NEUTRAL VAC 115 VAC - LO LINE.
12 PIN MOLEX CONNECTOR PART # 15210-7
SCANNING HEADS DC Ω ≈ 320 - 450
WHITE/RED 9 VEND SIGNAL CONTROL. ON = V_S - V_SAND 2000, OFF = SOURCE VDC ⚠
BLACK 2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC ⚠
SHIELD
SHIELD 4 DC COMMON FOR HEADS. ⚠4
BLACK 1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC ⚠
WHITE 11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
RED 10 DC COMMON.
RED 6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD ON = 15. VDC. OFF = 0 VDC.
MOTOR START SWITCH (FRONT).
SEQUENCE SWITCH (MIDDLE)
BILL EXIT SWITCH (REAR)
NO NC C
WHT/RED
RED
RED
DK. GREEN
YELLOW
YELLOW
BLACK
BLACK
WHT./GREEN
WHITE/BLACK
WHITE/YELLOW
WHT./GREEN
LOGIC
12 PIN MOLEX CONNECTOR PART # 15210-7
WHT./GRN. 12 MOTOR RUN SIGNAL ON = 15 VDC - OFF = 0 VDC.
11 SPARE
5 15. VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC - FWD = 0 VDC - REV. = 12. VDC.
RED
YEL. 1 DC COMMON. ⚠1
10 SPARE.
LT. BLUE 8 MOTOR RUN CONTROL LINE. OFF - 37 VDC, FWD 16 VDC, REV 10 VDC.
WHT./BLUE 3 37 VDC UNREGULATED FROM POWER P.C. BOARD. (FWD-33, REV-31)
YELLOW 6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6. VDC - STBY 37. VDC.
GRAY
BLACK GREEN 4 24 VAC INPUT TO POWER P.C. BOARD.
PRIMARY SECONDARY
BLACK GREEN 2 24 VAC INPUT TO POWER P.C. BOARD.
TRANSFORMER
PRIMARY - DC Ω ≈ 28.
SECONDARY - DC Ω ≈ 2.
POWER
WHT./BLUE
RED
YEL.
BLACK
MOTOR REVERSE RELAY ⚠
DC Ω ≈ 500.
MOTOR
RED - BLK. DC Ω 14 - 60.
YEL. - YEL. DC Ω 60 - 70.
GRAY
TUBING
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD. THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

NOTES:

⚠1 POLARIZING TERMINAL.

⚠2 WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.

3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.

⚠4 THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.

5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.

⚠6 RELAY IS SHOWN IN THE STANDBY POSITION (DE-ENERGIZED).

7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.

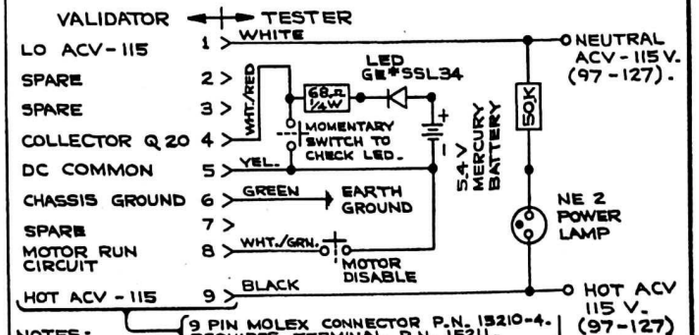
8. Y — TERMINAL PART # 15211. ⚠8 GOLD PLATED
↑ — TERMINAL PART # 15211-1. TERMINAL PN 15211-2.

GENERAL SPECIFICATIONS:

VERTICAL MOUNTING - THREE (3) BOSSES EACH SIDE.
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.
WEIGHT: 34-04-002 ≈ 6. LBS. LESS PACKING
ELECTRICAL INTERFACE - RIGHT SIDE (TOP MIDDLE).
POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP 5. WATTS.
RUNNING: .45 AMP 40. WATTS.
SURGE: 1.2 AMPS * WATTS.
VEND SIGNAL DURATION: 150 ± 50 MILLISECONDS.
VEND CIRCUIT POWER RATING: 50 MILLIAMPS AND 50 VDC MAX, (INDUCTOR TO USE TRANSIENT SUPPRESSION). - RESISTIVE.
CYCLE DURATION: 1.25 SECONDS.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

TESTER FOR 34-04-002 VALIDATOR

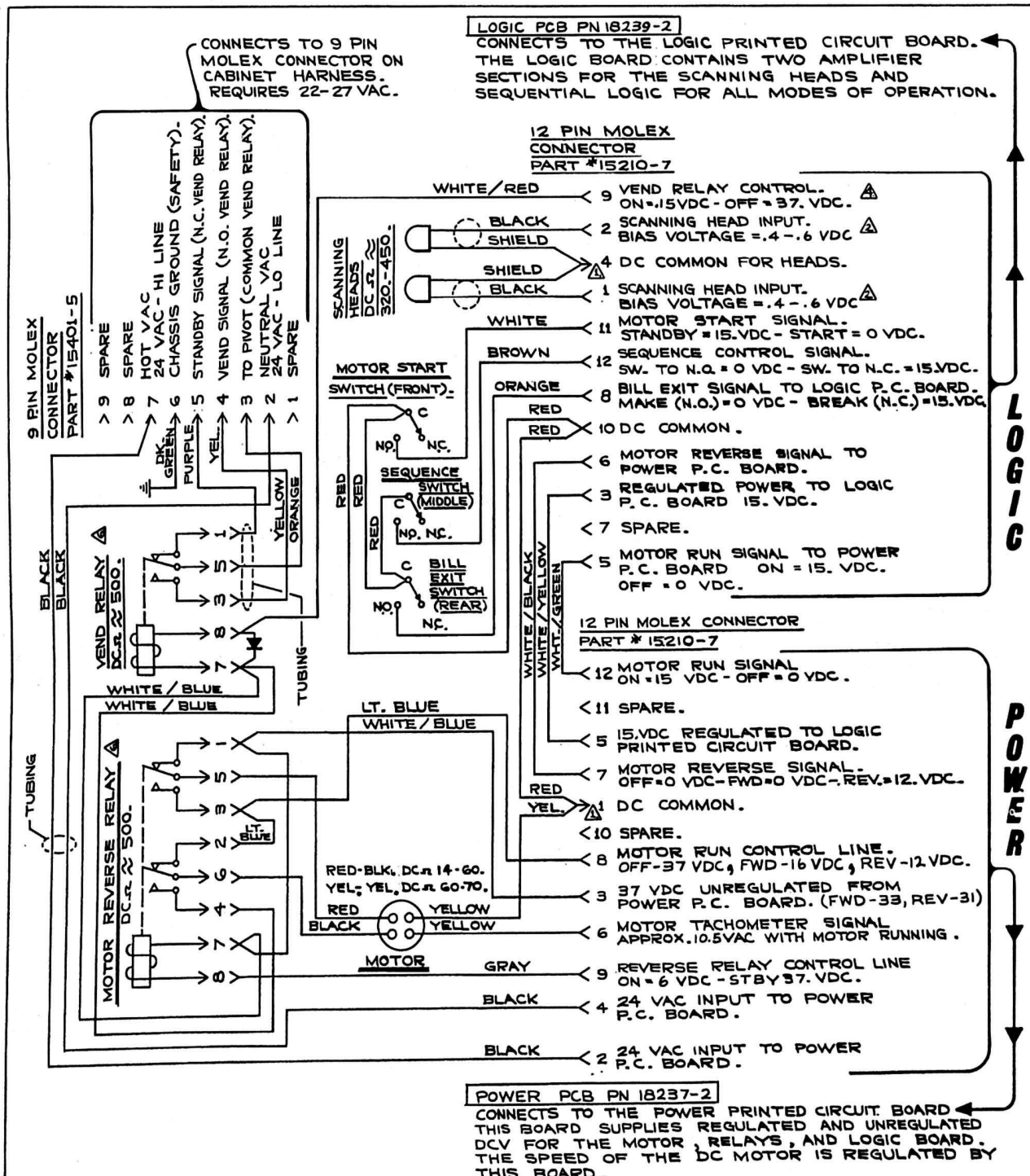


NOTES:
1. IF FUSED, USE NMT 1 AMP SLO-BLO IN TESTOR.
2. MOTOR SHOULD NOT RUN WITH MTR. DISABLE SW. IN MAKE POSITION.
3. THE LIGHT EMITTING DIODE (LED) IS RED IN COLOR WHEN ILLUMINATED.
4. THE LED SHOULD ILLUMINATE APPROXIMATELY 150. MILLI-SECONDS TO INDICATED VEND SIGNAL.

WIRING DIAGRAM
FOR THE 34-04-002
VALIDATOR (HUCKPASSER)

71313

NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.


LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 22-27 VAC.
9 PIN MOLEX CONNECTOR PART #15401-5
> 9 SPARE
> 8 SPARE
> 7 HOT VAC 24 VAC - HI LINE
> 6 CHASSIS GROUND (SAFETY)
> 5 STANDBY SIGNAL (N.C. VEND RELAY).
> 4 VEND SIGNAL (N.O. VEND RELAY).
> 3 TO PIVOT (COMMON VEND RELAY).
> 2 NEUTRAL VAC 24 VAC - LO LINE
> 1 SPARE
12 PIN MOLEX CONNECTOR PART #15210-7
WHITE/RED 9 VEND RELAY CONTROL. ON=.15VDC - OFF=37. VDC. 4
SCANNING HEADS DC Ω ≈ 320-450.
BLACK SHIELD 2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC 2
SHIELD 4 DC COMMON FOR HEADS. 1
SHIELD BLACK 1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC 2
WHITE 11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
RED 10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD ON = 15. VDC. OFF = 0 VDC.
MOTOR START SWITCH (FRONT)
SEQUENCE SWITCH (MIDDLE)
BILL EXIT SWITCH (REAR)
C NO. NC.
LOGIC
12 PIN MOLEX CONNECTOR PART # 15210-7
12 MOTOR RUN SIGNAL ON = 15 VDC - OFF = 0 VDC.
11 SPARE.
5 15. VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC - FWD = 0 VDC - REV. = 12. VDC.
RED YEL. 1 DC COMMON.
10 SPARE.
8 MOTOR RUN CONTROL LINE. OFF - 37 VDC, FWD - 16 VDC, REV - 12 VDC.
3 37 VDC UNREGULATED FROM POWER P.C. BOARD. (FWD - 33, REV - 31)
6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6 VDC - STBY 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC INPUT TO POWER P.C. BOARD.
POWER
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
BLACK BLACK
WHITE / BLUE
WHITE / BLUE
LT. BLUE WHITE / BLUE
TUBING
TUBING
YELLOW ORANGE
DK. GREEN PURPLE YEL.
WHITE / BLACK WHITE / YELLOW WHT. / GREEN
RED-BLK. DC Ω 14-60.
YEL.-YEL. DC Ω 60-70.
RED YELLOW BLACK YELLOW
MOTOR
LT. BLUE
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

NOTES

1. POLARIZING TERMINAL.
2. WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.
3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.
4. THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.
5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.
6. RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.
7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.
8. Y — TERMINAL PART # 15211.
   ↑ — TERMINAL PART # 15211-1.

GENERAL SPECIFICATIONS

MOUNTING: THE -003 IS A HORIZONTAL MOUNT UNIT AND IS SUPPLIED WITH STANDARD MTG. BRACKETS. THE -004 IS A VERTICAL MOUNT, WITHOUT INSERT SNOUT, WITHOUT MOUNTING BRACKETS.

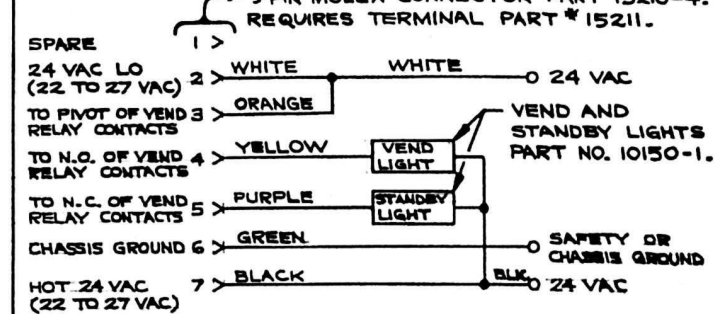
DIMENSIONS ≈ 5 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.

ELECTRICAL INTERFACE - LOCATED ON THE REAR PANEL FOR THE -003. THE -004 IS ON THE LEFT SIDE.

POWER REQUIREMENTS AT 24 VAC (RANGE 22-27 VAC):
- STANDBY: .09 AMP - 2.1 WATTS.
- RUNNING: 1.2 AMP - 35. WATTS.
- SURGE: 6.0 AMP - * WATTS.

VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-003 ≈ 5 1/2 LBS. LESS PACKING.
34-04-004 ≈ 5. LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

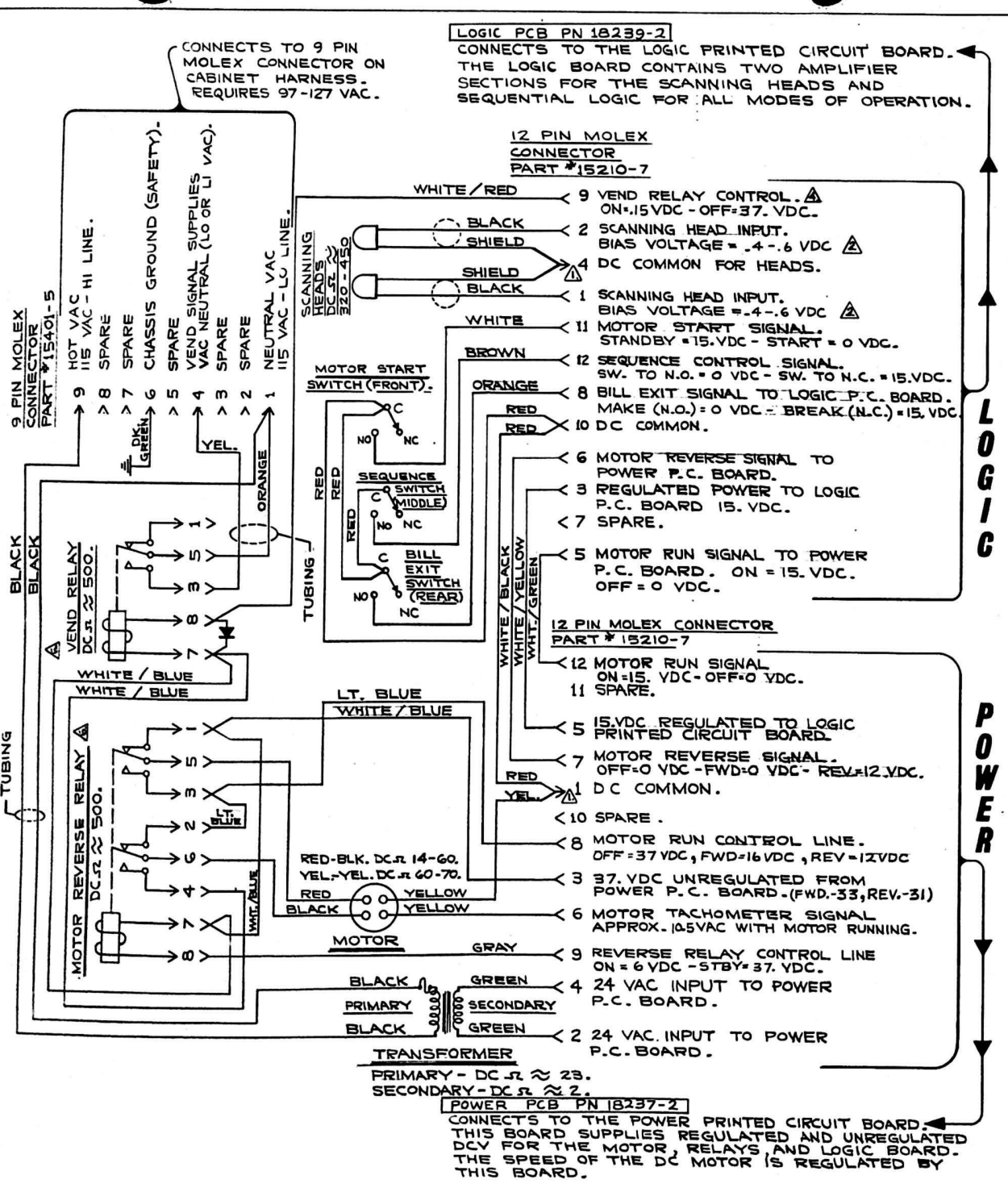

9 PIN MOLEX CONNECTOR PART # 15210-4.
REQUIRES TERMINAL PART # 15211.
SPARE 1
24 VAC LO (22 TO 27 VAC) 2 WHITE WHITE 24 VAC
TO PIVOT OF VEND RELAY CONTACTS 3 ORANGE
TO N.O. OF VEND RELAY CONTACTS 4 YELLOW VEND LIGHT
TO N.C. OF VEND RELAY CONTACTS 5 PURPLE STANDBY LIGHT
VEND AND STANDBY LIGHTS PART NO. 10150-1.
CHASSIS GROUND 6 GREEN SAFETY OR CHASSIS GROUND
HOT 24 VAC (22 TO 27 VAC) 7 BLACK BLK 24 VAC

WIRING DIAGRAM FOR TESTER

NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.

WIRING DIAGRAM
FOR THE 34-04-003 AND -004
VALIDATORS (BUCKPASSERS)

71313


LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 97-127 VAC.
9 PIN MOLEX CONNECTOR PART #15401-5
12 PIN MOLEX CONNECTOR PART #15210-7
SCANNING HEADS DC Ω ≈ 320-450
MOTOR START SWITCH (FRONT)
SEQUENCE SWITCH MIDDLE
BILL EXIT SWITCH (REAR)
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
TUBING
LOGIC
POWER
9 HOT VAC 115 VAC - HI LINE.
8 SPARE
7 SPARE
6 CHASSIS GROUND (SAFETY).
5 SPARE
4 VEND SIGNAL SUPPLIES VAC NEUTRAL (LO OR LI VAC).
3 SPARE
2 SPARE
1 NEUTRAL VAC 115 VAC - LO LINE.
9 VEND RELAY CONTROL. ON=.15 VDC - OFF=37. VDC.
2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC
4 DC COMMON FOR HEADS.
1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC
11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD. ON = 15. VDC. OFF = 0 VDC.
12 MOTOR RUN SIGNAL ON=15. VDC - OFF=0 VDC.
11 SPARE.
5 15. VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF=0 VDC - FWD=0 VDC - REV=12 VDC.
1 DC COMMON.
10 SPARE.
8 MOTOR RUN CONTROL LINE. OFF=37 VDC, FWD=16 VDC, REV=12 VDC
3 37. VDC UNREGULATED FROM POWER P.C. BOARD. (FWD.-33, REV.-31)
6 MOTOR TACHOMETER SIGNAL APPROX. 105 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6 VDC - STBY = 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC. INPUT TO POWER P.C. BOARD.
RED-BLK. DC Ω 14-60.
YEL.-YEL. DC Ω 60-70.
MOTOR
TRANSFORMER
PRIMARY - DC Ω ≈ 23.
SECONDARY - DC Ω ≈ 2.
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD. THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

WIRING DIAGRAM

FOR THE 34-04-005 ⚠ AND THE 34-04-008 & -012 VALIDATORS (BUCKPASSERS)

71313

⚠ APPLICABLE FOR -005's WITH SERIAL NO.S HAVING A NO. OF -06 OR LESS AS THE LAST TWO DIGITS.

NOTES

⚠ POLARIZING TERMINAL.

⚠ WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.

3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.

⚠ THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.

5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.

⚠ RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.

7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.

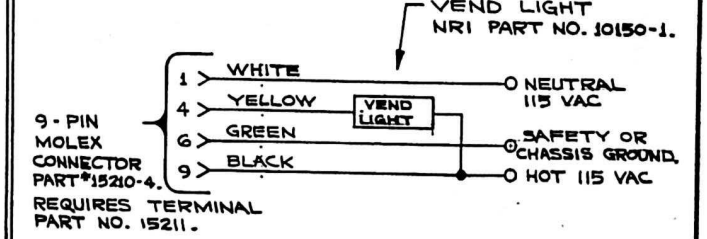
8 Y — TERMINAL PART # 15211.
↑ — TERMINAL PART # 15211-1.

GENERAL SPECIFICATIONS

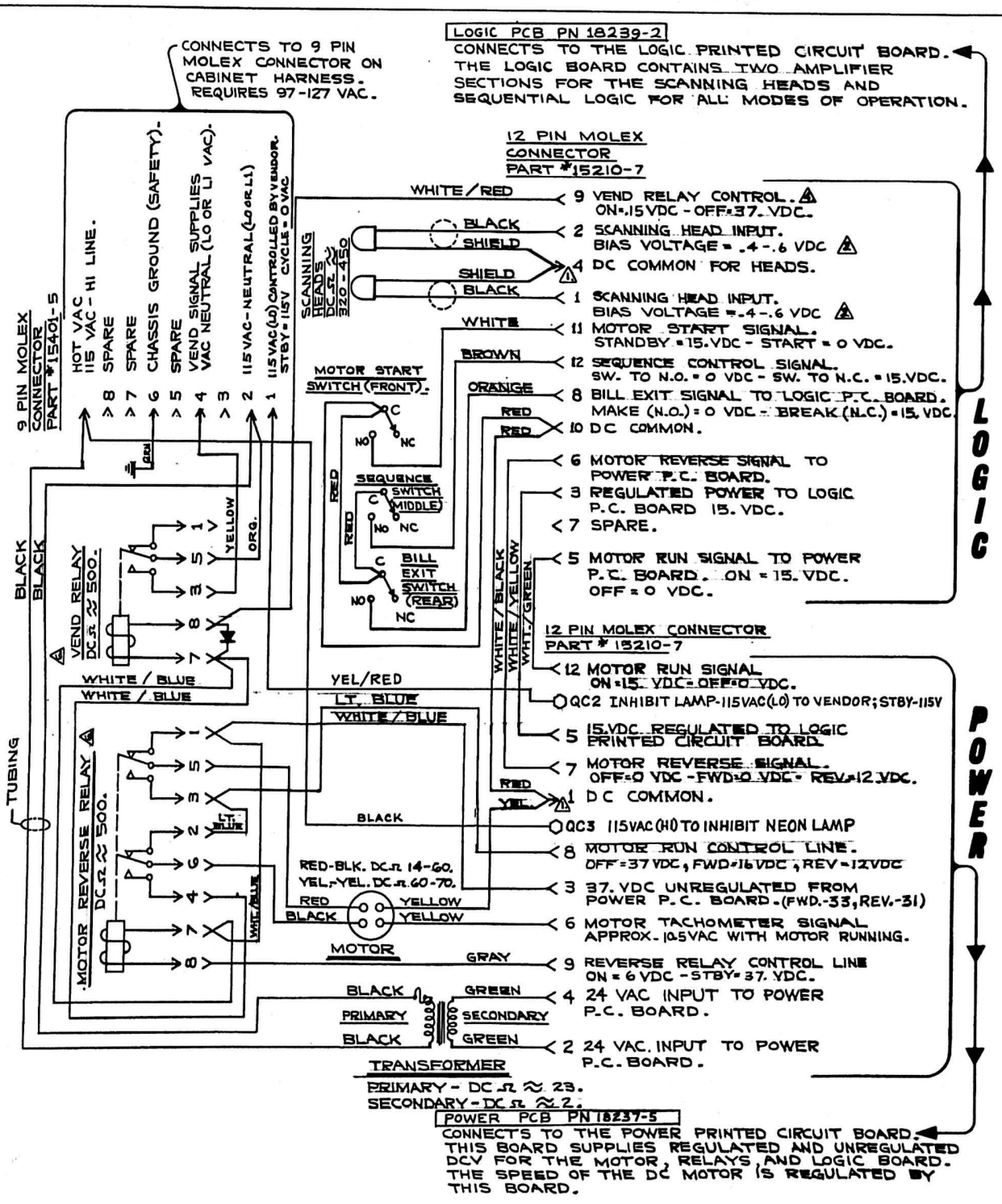
MOUNTING: THE -005 IS A HORIZONTAL MOUNT UNIT AND IS SUPPLIED WITH STANDARD MOUNTING BRACKETS. THE -008 IS A VERTICAL MOUNT UNIT, WITHOUT MOUNTING BRACKETS.
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.
ELECTRICAL INTERFACE - THE -005 CONNECTOR IS ON THE REAR. THE -008 IS ON THE RIGHT SIDE.
POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP - 5. WATTS.
RUNNING: .45 AMP - 40. WATTS.
SURGE: 1.2 AMPS - * WATTS.
VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-005 ≈ 6 1/2 LBS. LESS PACKING.
34-04-008 ≈ 6. LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

TESTER SCHEMATIC



NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.


CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 97-127 VAC.
LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
12 PIN MOLEX CONNECTOR PART #15210-7
9 PIN MOLEX CONNECTOR PART #15401-5
HOT VAC 115 VAC - HI LINE.
SPARE
SPARE
CHASSIS GROUND (SAFETY).
SPARE
VEND SIGNAL SUPPLIES VAC NEUTRAL (LO OR LI VAC).
115 VAC - NEUTRAL (LO OR LI)
115 VAC (LO) CONTROLLED BY VENDOR. STBY = 115V CYCLE = 0 VAC
SCANNING HEADS DC Ω ≈ 320 - 450
MOTOR START SWITCH (FRONT)
SEQUENCE SWITCH MIDDLE
BILL EXIT SWITCH (REAR)
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
TUBING
BLACK
BLACK
YELLOW
ORG.
RED
RED
WHITE / BLUE
WHITE / BLUE
YEL/RED
LT. BLUE
WHITE / BLUE
WHITE / BLACK
WHT / YELLOW
WHT / GREEN
RED
YEL.
BLACK
LT. BLUE
WHITE / BLUE
RED-BLK. DC Ω 14-60.
YEL-YEL. DC Ω 60-70.
RED
BLACK
YELLOW
YELLOW
MOTOR
PRIMARY
SECONDARY
BLACK
GREEN
TRANSFORMER
PRIMARY - DC Ω ≈ 23.
SECONDARY - DC Ω ≈ 2.
WHITE/RED
BLACK
SHIELD
SHIELD
BLACK
WHITE
BROWN
ORANGE
RED
RED
GRAY
GREEN
9 VEND RELAY CONTROL. ⚠ ON=.15 VDC - OFF=37. VDC.
2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC ⚠
4 DC COMMON FOR HEADS.
1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 - .6 VDC ⚠
11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD. ON = 15. VDC. OFF = 0 VDC.
LOGIC
12 PIN MOLEX CONNECTOR PART # 15210-7
12 MOTOR RUN SIGNAL ON = 15. VDC - OFF = 0 VDC.
QC2 INHIBIT LAMP - 115 VAC (LO) TO VENDOR; STBY - 115V
5 15. VDC. REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC - FWD = 0 VDC - REV = 12 VDC.
1 DC COMMON.
QC3 115 VAC (HO) TO INHIBIT NEON LAMP
8 MOTOR RUN CONTROL LINE. OFF = 37 VDC, FWD = 16 VDC, REV = 12 VDC
3 37. VDC UNREGULATED FROM POWER P.C. BOARD. (FWD. -33, REV. -31)
6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6 VDC - STBY = 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC. INPUT TO POWER P.C. BOARD.
POWER
POWER PCB PN 18237-5
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD. THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

NOTES

⚠ POLARIZING TERMINAL.

⚠ WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.

3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.

⚠ THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.

5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.

⚠ RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.

7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.

8. Y — TERMINAL PART # 15211. ○ TERMINAL PART NO. 2321-3
↑ — TERMINAL PART # 15211-1.

GENERAL SPECIFICATIONS

MOUNTING: THE -005 IS A HORIZONTAL MOUNT UNIT AND IS SUPPLIED WITH SPECIAL MOUNTING BRACKETS; EFFECTIVE FOR SN's HAVING A NO. OF 06 OR GREATER AS THE LAST TWO DIGITS.

DIMENSIONS ≈ 5¼" WIDE, 5¼" HIGH, 6" DEEP.

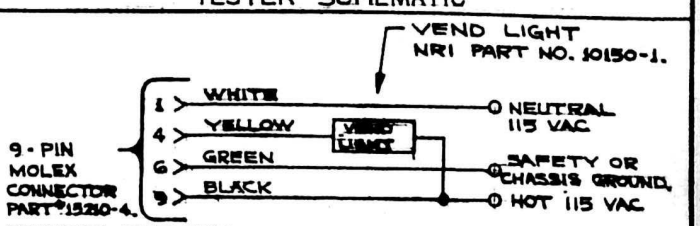
ELECTRICAL INTERFACE - THE -005 CONNECTOR IS ON THE REAR.

POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP - 5. WATTS.
RUNNING: .45 AMP - 40. WATTS.
SURGE: 1.2 AMPS - * WATTS.

VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-005 ≈ 6½ LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

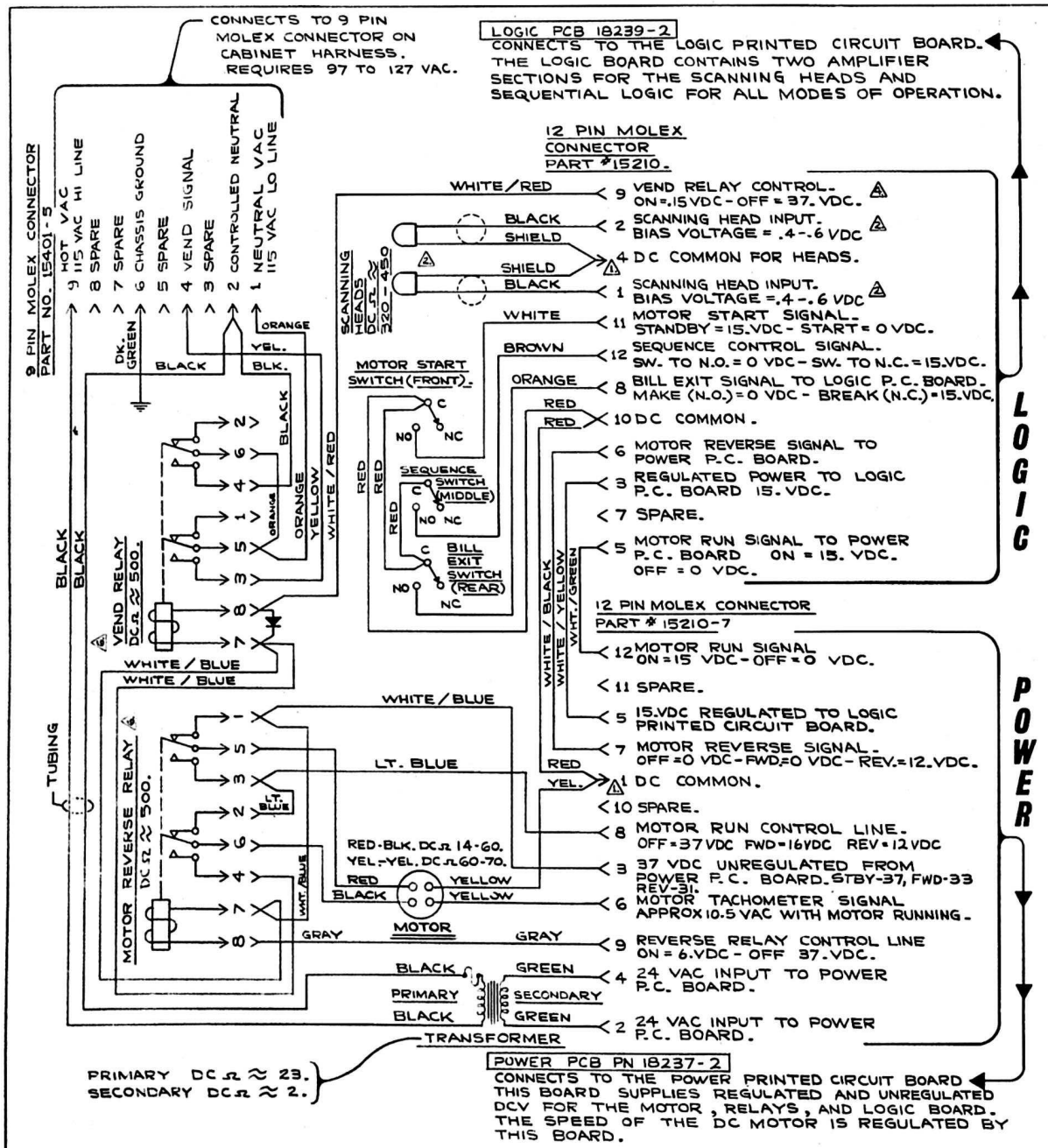
TESTER SCHEMATIC



WIRING DIAGRAM FOR 34-04-005, NRI'S BUCKPASSER.
APPLICABLE FOR UNITS HAVING SN's WITH THE LAST TWO DIGITS BEING 07 OR GREATER (i.e. THE VAL. SN).

71313

NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2513.


CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 97 TO 127 VAC.
LOGIC PCB 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
9 PIN MOLEX CONNECTOR PART NO. 15401-5
1 NEUTRAL VAC 115 VAC LO LINE
2 CONTROLLED NEUTRAL
3 SPARE
4 VEND SIGNAL
5 SPARE
6 CHASSIS GROUND
7 SPARE
8 SPARE
9 115 VAC HI LINE HOT VAC
12 PIN MOLEX CONNECTOR PART # 15210.
SCANNING HEADS DC Ω ≈ 320-450
WHITE/RED 9 VEND RELAY CONTROL. ON=.15 VDC - OFF = 37. VDC.
BLACK 2 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 -.6 VDC
SHIELD
4 DC COMMON FOR HEADS.
SHIELD
BLACK 1 SCANNING HEAD INPUT. BIAS VOLTAGE = .4 -.6 VDC
WHITE 11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
RED 10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD ON = 15. VDC. OFF = 0 VDC.
LOGIC
MOTOR START SWITCH (FRONT).
C NO NC
SEQUENCE SWITCH (MIDDLE)
BILL EXIT SWITCH (REAR)
12 PIN MOLEX CONNECTOR PART # 15210-7
12 MOTOR RUN SIGNAL ON = 15 VDC - OFF = 0 VDC.
11 SPARE.
5 15. VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC - FWD = 0 VDC - REV. = 12. VDC.
1 DC COMMON.
10 SPARE.
8 MOTOR RUN CONTROL LINE. OFF = 37 VDC FWD = 16 VDC REV = 12 VDC
3 37 VDC UNREGULATED FROM POWER P.C. BOARD. STBY-37, FWD-33 REV-31.
6 MOTOR TACHOMETER SIGNAL APPROX 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6. VDC - OFF 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC INPUT TO POWER P.C. BOARD.
POWER
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
MOTOR
TRANSFORMER
PRIMARY DC Ω ≈ 23.
SECONDARY DC Ω ≈ 2.
TUBING
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

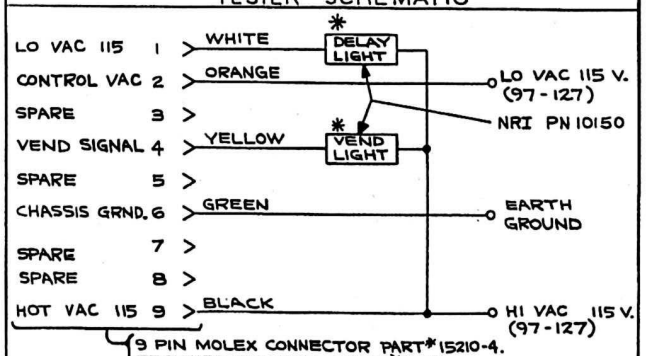
NOTES

1. POLARIZING TERMINAL.
2. WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.
3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.
4. THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.
5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.
6. RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.
7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.
8. Y — TERMINAL PART # 15211.
   ↑ — TERMINAL PART # 15211-1.

GENERAL SPECIFICATIONS

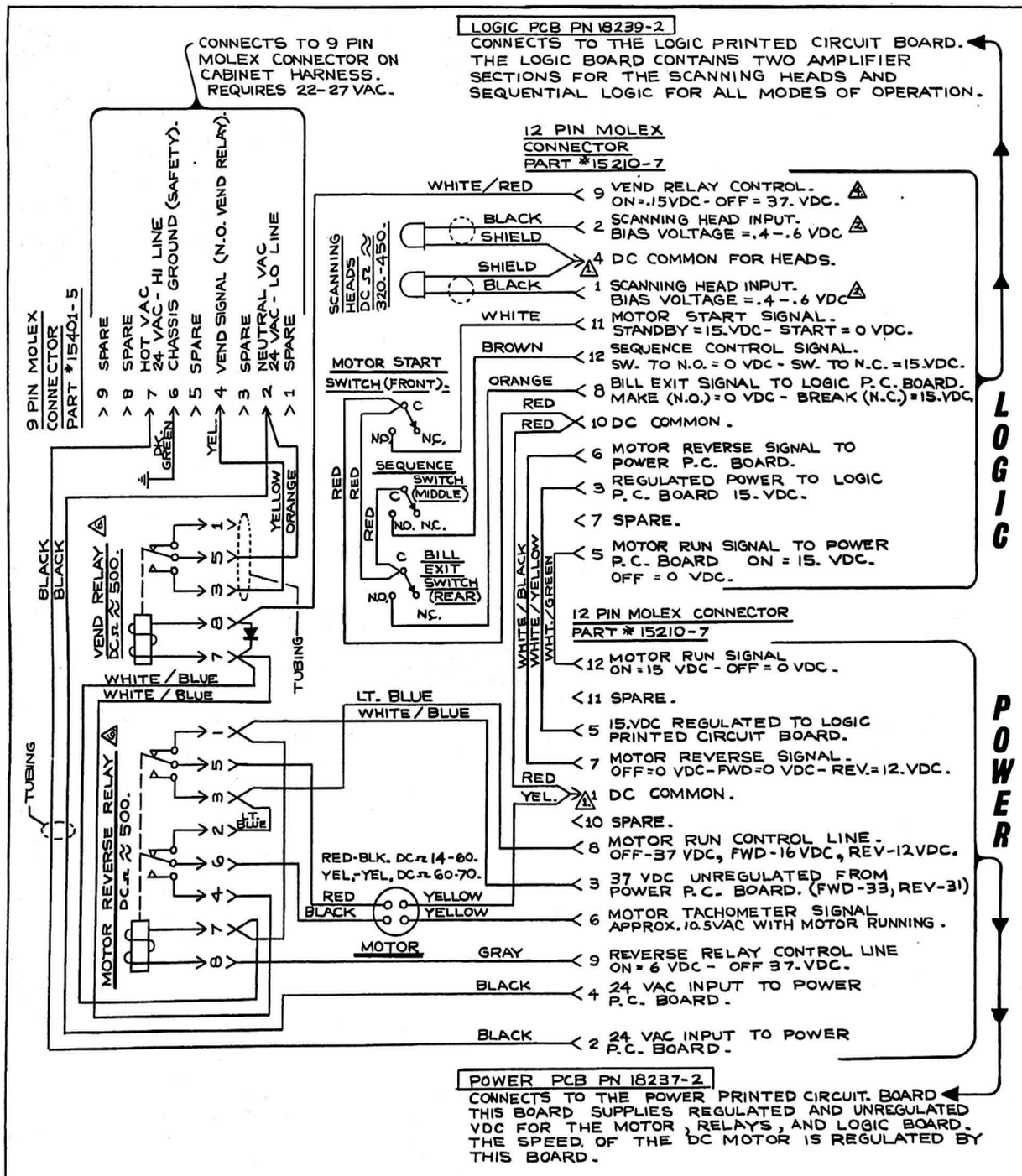
MOUNTING — THE -006 AND THE -010 ARE BOTH HORIZONTAL MOUNT UNITS. THE -006 IS SUPPLIED WITH SPECIAL MOUNTING BRACKETS WHEREAS THE -010 HAS STANDARD BRACKETS.
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.
WEIGHT: 34-04-006 ≈ 6 1/2 LBS. LESS PACKING.
34-04-010 ≈ 6 1/2 LBS. LESS PACKING.
ELECTRICAL INTERPACE — LOCATED ON RIGHT SIDE FOR -006 AND REAR FOR -010.
POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP 5. WATTS.
RUNNING: .45 AMP 40. WATTS.
SURGE: 1.2 AMPS * WATTS.
VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
CYCLE DURATION: 1.25 SECONDS.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
*OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

TESTER SCHEMATIC



WIRING DIAGRAM
FOR THE 34-04-006
AND THE 34-04-010
VALIDATORS (BUCKPASSERS)

NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.


LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 22-27 VAC.
9 PIN MOLEX CONNECTOR PART * 15401-5
9 SPARE
8 SPARE
7 HOT VAC 24 VAC - HI LINE
6 CHASSIS GROUND (SAFETY).
5 SPARE
4 VEND SIGNAL (N.O. VEND RELAY).
3 SPARE
2 NEUTRAL VAC 24 VAC - LO LINE
1 SPARE
12 PIN MOLEX CONNECTOR PART * 15210-7
WHITE/RED 9 VEND RELAY CONTROL. ON=.15VDC - OFF = 37. VDC.
SCANNING HEADS DC Ω ≈ 320-450.
BLACK SHIELD 2 SCANNING HEAD INPUT. BIAS VOLTAGE =.4-.6 VDC
SHIELD BLACK 4 DC COMMON FOR HEADS.
1 SCANNING HEAD INPUT. BIAS VOLTAGE =.4-.6 VDC
WHITE 11 MOTOR START SIGNAL. STANDBY = 15.VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15.VDC.
MOTOR START SWITCH (FRONT)
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15.VDC.
SEQUENCE SWITCH (MIDDLE)
BILL EXIT SWITCH (REAR)
RED 10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 SPARE.
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD ON = 15. VDC. OFF = 0 VDC.
LOGIC
12 PIN MOLEX CONNECTOR PART * 15210-7
12 MOTOR RUN SIGNAL ON = 15 VDC - OFF = 0 VDC.
11 SPARE.
5 15.VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC - FWD = 0 VDC - REV. = 12. VDC.
RED YEL. 1 DC COMMON.
10 SPARE.
8 MOTOR RUN CONTROL LINE. OFF-37 VDC, FWD-16 VDC, REV-12 VDC.
3 37 VDC UNREGULATED FROM POWER P.C. BOARD. (FWD-33, REV-31)
6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 6 VDC - OFF 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC INPUT TO POWER P.C. BOARD.
POWER
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
TUBING
BLACK
WHITE/BLUE
LT. BLUE
YELLOW
ORANGE
RED-BLK. DC Ω 14-60.
YEL.-YEL. DC Ω 60-70.
MOTOR
POWER PCB PN 18237-2
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD THIS BOARD SUPPLIES REGULATED AND UNREGULATED VDC FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

WIRING DIAGRAM
FOR THE 34-04-007 AND -011 VALIDATORS (BUCKPASSERS)

71313

NOTES

1. ⚠ POLARIZING TERMINAL.
2. ⚠ WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.
3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.
4. ⚠ THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.
5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.
6. ⚠ RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.
7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.
8. Y — TERMINAL PART * 15211.
   ↑ — TERMINAL PART * 15211-1.

GENERAL SPECIFICATIONS

MOUNTING: THE -007 IS A HORIZONTAL MOUNT UNIT AND IS SUPPLIED WITH STANDARD MTG. BRACKETS. THE-011 IS A VERTICAL MOUNT, WITHOUT MOUNTING BRACKETS.

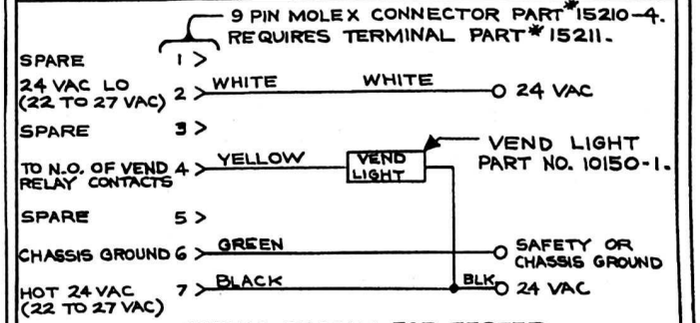
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.

ELECTRICAL INTERFACE - LOCATED ON THE REAR PANEL FOR THE-007. THE-011 IS ON THE LEFT SIDE.

POWER REQUIREMENTS AT 24 VAC (RANGE 22-27 VAC):
- STANDBY: .09 AMP - 2.1 WATTS.
- RUNNING: 1.2 AMP - 35. WATTS.
- SURGE: 6.0 AMP - * WATTS.

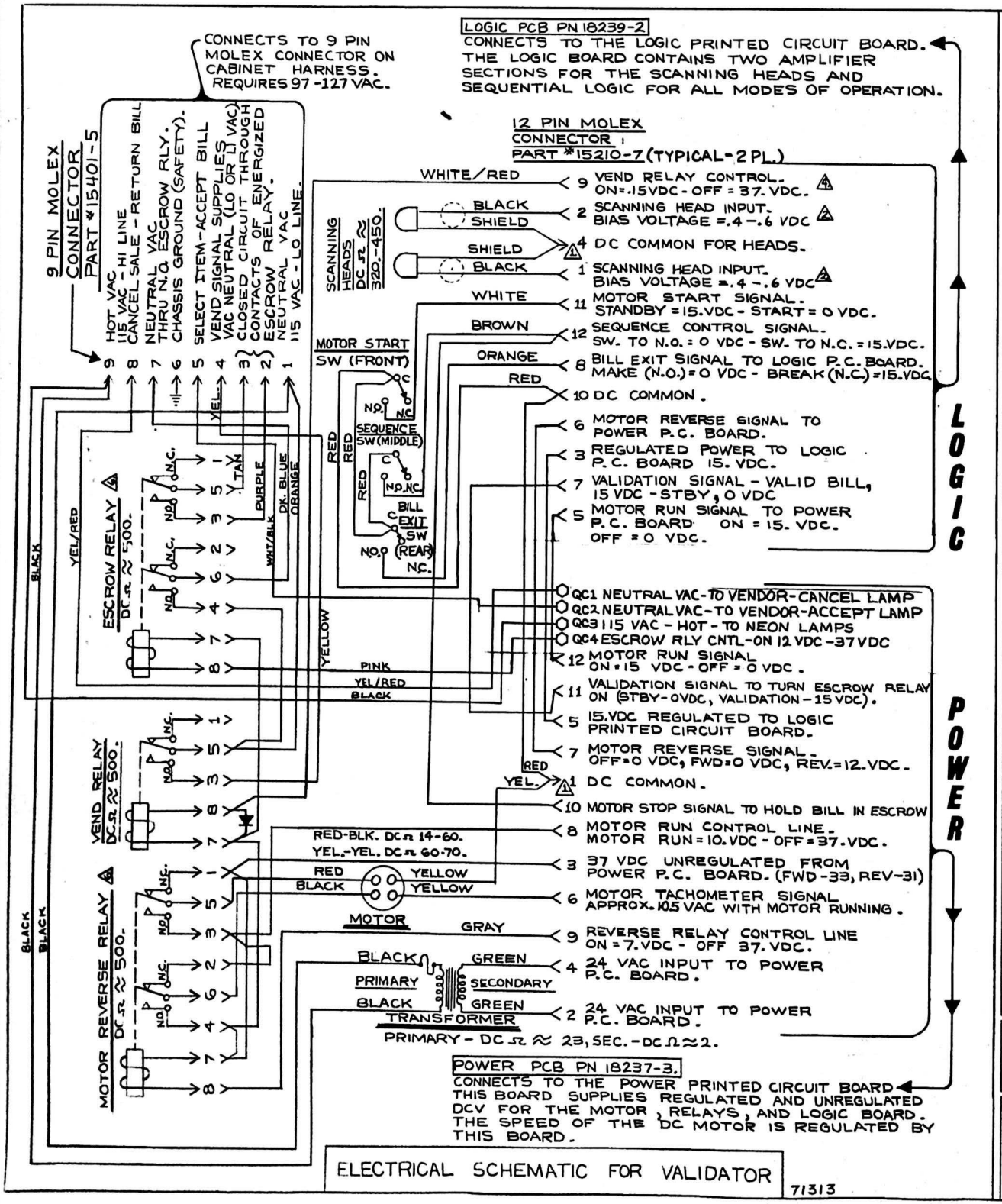
VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-007 ≈ 5 1/2 LBS. LESS PACKING.
34-04-011 ≈ 5. LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.


9 PIN MOLEX CONNECTOR PART * 15210-4.
REQUIRES TERMINAL PART * 15211.
1 > SPARE
2 > 24 VAC LO (22 TO 27 VAC) WHITE WHITE 24 VAC
3 > SPARE
4 > TO N.O. OF VEND RELAY CONTACTS YELLOW VEND LIGHT
VEND LIGHT PART NO. 10150-1.
5 > SPARE
6 > CHASSIS GROUND GREEN SAFETY OR CHASSIS GROUND
7 > HOT 24 VAC (22 TO 27 VAC) BLACK BLK 24 VAC

WIRING DIAGRAM FOR TESTER

NATIONAL REJECTORS INDUSTRIES.
HIGHWAY 88 P.O. BOX 1550.
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.


LOGIC PCB PN 18239-2
CONNECTS TO THE LOGIC PRINTED CIRCUIT BOARD. THE LOGIC BOARD CONTAINS TWO AMPLIFIER SECTIONS FOR THE SCANNING HEADS AND SEQUENTIAL LOGIC FOR ALL MODES OF OPERATION.
CONNECTS TO 9 PIN MOLEX CONNECTOR ON CABINET HARNESS. REQUIRES 97-127 VAC.
9 PIN MOLEX CONNECTOR PART #15401-5
12 PIN MOLEX CONNECTOR PART #15210-7 (TYPICAL-2 PL.)
HOT VAC 115 VAC - HI LINE
CANCEL SALE - RETURN BILL
NEUTRAL VAC THRU N.O. ESCROW RLY.
CHASSIS GROUND (SAFETY).
SELECT ITEM-ACCEPT BILL
VEND SIGNAL SUPPLIES VAC NEUTRAL (LO OR 0 VAC) CLOSED CIRCUIT THROUGH CONTACTS OF ENERGIZED ESCROW RELAY.
NEUTRAL VAC 115 VAC - LO LINE.
WHITE/RED 9 VEND RELAY CONTROL. ON=.15VDC - OFF = 37. VDC.
BLACK 2 SCANNING HEAD INPUT. BIAS VOLTAGE =.4 -.6 VDC
SHIELD
SHIELD 4 DC COMMON FOR HEADS.
BLACK 1 SCANNING HEAD INPUT. BIAS VOLTAGE =.4 -.6 VDC
SCANNING HEADS DC Ω ≈ 320.-450.
WHITE 11 MOTOR START SIGNAL. STANDBY = 15. VDC - START = 0 VDC.
BROWN 12 SEQUENCE CONTROL SIGNAL. SW. TO N.O. = 0 VDC - SW. TO N.C. = 15. VDC.
ORANGE 8 BILL EXIT SIGNAL TO LOGIC P.C. BOARD. MAKE (N.O.) = 0 VDC - BREAK (N.C.) = 15. VDC.
RED 10 DC COMMON.
6 MOTOR REVERSE SIGNAL TO POWER P.C. BOARD.
3 REGULATED POWER TO LOGIC P.C. BOARD 15. VDC.
7 VALIDATION SIGNAL - VALID BILL, 15 VDC - STBY, 0 VDC
5 MOTOR RUN SIGNAL TO POWER P.C. BOARD ON = 15. VDC. OFF = 0 VDC.
MOTOR START SW (FRONT)
SEQUENCE SW (MIDDLE)
BILL EXIT SW (REAR)
LOGIC
QC1 NEUTRAL VAC - TO VENDOR - CANCEL LAMP
QC2 NEUTRAL VAC - TO VENDOR - ACCEPT LAMP
QC3 115 VAC - HOT - TO NEON LAMPS
QC4 ESCROW RLY CNTL - ON 12 VDC - 37 VDC
12 MOTOR RUN SIGNAL ON = 15 VDC - OFF = 0 VDC.
11 VALIDATION SIGNAL TO TURN ESCROW RELAY ON (STBY - 0VDC, VALIDATION - 15 VDC).
5 15. VDC REGULATED TO LOGIC PRINTED CIRCUIT BOARD.
7 MOTOR REVERSE SIGNAL. OFF = 0 VDC, FWD = 0 VDC, REV. = 12. VDC.
1 DC COMMON.
10 MOTOR STOP SIGNAL TO HOLD BILL IN ESCROW
8 MOTOR RUN CONTROL LINE. MOTOR RUN = 10. VDC - OFF = 37. VDC.
3 37 VDC UNREGULATED FROM POWER P.C. BOARD. (FWD-33, REV-31)
6 MOTOR TACHOMETER SIGNAL APPROX. 10.5 VAC WITH MOTOR RUNNING.
9 REVERSE RELAY CONTROL LINE ON = 7. VDC - OFF 37. VDC.
4 24 VAC INPUT TO POWER P.C. BOARD.
2 24 VAC INPUT TO POWER P.C. BOARD.
ESCROW RELAY DC Ω ≈ 500.
VEND RELAY DC Ω ≈ 500.
MOTOR REVERSE RELAY DC Ω ≈ 500.
RED-BLK. DC Ω 14-60.
YEL.-YEL. DC Ω 60-70.
MOTOR
TRANSFORMER
PRIMARY - DC Ω ≈ 23, SEC. - DC Ω ≈ 2.
POWER
POWER PCB PN 18237-3.
CONNECTS TO THE POWER PRINTED CIRCUIT BOARD THIS BOARD SUPPLIES REGULATED AND UNREGULATED DCV FOR THE MOTOR, RELAYS, AND LOGIC BOARD. THE SPEED OF THE DC MOTOR IS REGULATED BY THIS BOARD.

ELECTRICAL SCHEMATIC FOR VALIDATOR

71313

NOTES

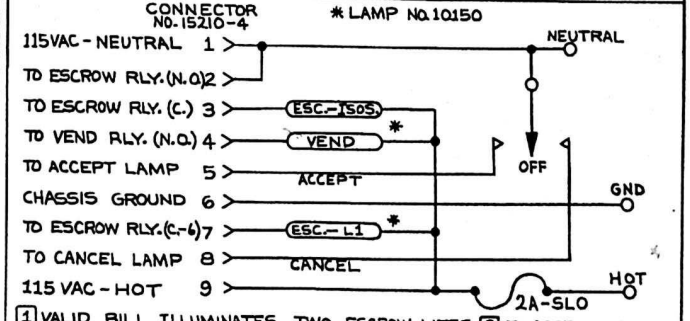
1. POLARIZING TERMINAL.
2. WHEN MONITORING THESE POINTS THE SHUNT VALUE OF THE TEST EQUIPEMENT MAY CAUSE A NORMALLY ACCEPTED BILL TO REJECT.
3. ALL DC VOLTAGE VALUES AT THE ELECTRICAL INTERFACES ARE MEASURED RELATIVE TO DC COMMON.
4. THE CHANGE IN SIGNAL LEVELS MAY OR MAY NOT BE OBSERVED CONTINGENT ON RESPONSE TIME OF THE TEST EQUIPEMENT BEING USED.
5. THE NOMENCLATURE N.O. MEANS NORMALLY OPEN OR MAKE POSITION AND N.C. MEANS NORMALLY CLOSED OR BREAK POSITION.
6. RELAYS ARE SHOWN IN THE STANDBY POSITION (DE-ENERGIZED) AND ARE INTERCHANGEABLE.
7. ALL VOLTAGE AND RESISTANCE VALUES ARE APPROXIMATE AND POSITIVE UNLESS OTHERWISE SPECIFIED.
8. Y — TERMINAL PART # 15211. ↑ — TERMINAL PART # 15211-1. O TERMINAL PART NO. 2321-3.

GENERAL SPECIFICATIONS

THESE UNITS ARE DESIGNED FOR MOUNTING HORIZONTALLY. MOUNTING BRACKETS OF STANDARD CONFIGURATION ARE SUPPLIED WITH EACH UNIT.
DIMENSIONS ≈ 3 1/4" WIDE, 5 3/4" HIGH, 6" DEEP.
THE ELECTRICAL CONNECTOR IS ON THE REAR PANEL (TOP RT.)
POWER REQUIREMENTS AT 115 VAC (RANGE 97-127 VAC):
STANDBY: .06 AMP - 5. WATTS.
RUNNING: .45 AMP - 40. WATTS.
SURGE: 1.2 AMPS - * WATTS.
VEND SIGNAL DURATION: 150. ± 50. MILLISECONDS.
VEND CIRCUIT POWER RATING: 3. AMP. MAX. - RESISTIVE.
TEMPERATURE RANGE: 40° F. TO 140° F.
ONE DOLLAR BILLS MUST BE INSERTED BLACK SIDE UP (HEAD-UP), WITH HEAD TO THE RIGHT OR LEFT.
CYCLE DURATION: 1.25 SECONDS.
WEIGHT: 34-04-009 ≈ 7 LBS. LESS PACKING.

* OCCURS WHEN INITIAL POWER IS APPLIED AND DOES NOT EXCEED .050 SECONDS IN DURATION.

TESTER SCHEMATIC



1 VALID BILL ILLUMINATES TWO ESCROW LITES. 2 TO ACCEPT HOLD SW UNTIL BILL CLEARS REAR-VEND LITE ON. 3 TO REJECT HOLD SW UNTIL ESC LITES OFF AND BILL RETURNS.

APPLICATION DATA SHEET FOR THE NRI BUCKPASSER BILL VALIDATOR MODEL NO. 34-04-009 SINGLE BILL ESCROW

NATIONAL REJECTORS INDUSTRIES
HOT SPRINGS, ARKANSAS, U.S.A. 71901
PHONE: (501) 767-2313.

SERVICE NOTATIONS

National Vendors 404 934-0810
2048 Weems Rd
Tucker GA
~~30084~~
30084

The Quality and Scope of NRI Products is matched by the Quality and Scope of its Service Organization

To market its equipment, NRI has developed a sales and service organization that is not only national but international in scope. Sales and service centers, representatives and manufacturing facilities are widely distributed to assure NRI customers immediate purchase, service and consultation involving their changing needs.

SALES AND SERVICE CENTERS

ATLANTA
National Rejectors Industries
4297 Northeast Expressway
Atlanta, Georgia 30340
(404) 939-4950

CHICAGO
National Rejectors Industries
9650 Allen Avenue
Rosemont, Illinois 60018
(312) 622-3614

DALLAS
National Rejectors Industries
14057 Proton Road
Dallas, Texas 75240
(214) 387-4597

DAYTONA BEACH
National Rejectors Industries
930 Orange Avenue
Daytona Beach, Fla. 32014
(904) 253-5050

LOS ANGELES
National Rejectors Industries
6940 Knott Ave., Suite A
Buena Park, Calif. 90621
(714) 523-7770

MONTREAL
Nevend Industries Limited
875 Montee de Liesse
St. Laurent
Montreal, Quebec
(514) 341-3238

NEW YORK
National Rejectors Industries
42-71 65th Place
Woodside, L. I.
New York 11377
(212) 672-3200

ST. LOUIS
National Rejectors Industries
44 Worthington Access
Maryland Heights, Mo. 63043
(314) 434-9230

TORONTO
Navend Industries Limited
2 Banigan Drive
Toronto 17, Ontario
(416) 421-0541

VANCOUVER
Navend Industries Limited
8559 Main Street
Vancouver, B.C.
(604) 324-3214

FACTORY AUTHORIZED SERVICE CENTERS

BALTIMORE
Vendors Repair Service
1509 Vera Ave.
Baltimore, Md. 21227
(301) 242-0057

BOSTON
Vending Electronics Serv. Co.
111 Cross Street
West Quincy, Mass. 02169
(617) 479-0347

CRESTLINE, OHIO
Ken Zehnder and Assoc.
300 Warehouse Rd.
Crestline, Ohio 44827
(419) 683-1191

DENVER
Francone Eq. & Ser. Co.
4101 Inca Street
Denver, Colorado 80211
(303) 433-8857

DETROIT
Vendors Internat'l Dist. Co.
5812 Tireman
Detroit, Michigan 48204
(313) 898-2880

MEMPHIS
Vendors Sales & Service
3126 SandBrook
Memphis, Tn. 38116
(901) ~~398-2880~~

MIAMI
Automated Business Mach.
97 NE 13th Street
Miami, Fl. 33132
(305) ~~358-7550~~

MINNEAPOLIS
Bev-Serv
4439 Hiawatha Ave., South
Minneapolis, Minn. 55406
(612) 721-7405

OAKLAND
Lesco Eq. Distributors, Inc.
828 98th Avenue
Oakland, California 94603
(415) 562-0949

PITTSBURGH
Vending Maintenance Co.
423 Winterset Drive
Pittsburgh, Pa. 15209
(412) 781-8827

PORTLAND
Vendor's Service Center, Inc.
2627 S. E. Holgate Blvd.
Portland, Oregon 97202
(503) 234-0541

RALEIGH
Owen-Barbot, Inc.
Hwy. 401 No., P. O. Box 11456
Raleigh, N.C. 27609
(919) 876-4919

RICHMOND
Richmond Recon. Co.
17 South 21st Street
Richmond, Virginia 23223
(804) 644-6642

SALT LAKE CITY
Beehive Service Co.
415 Saunders Street
Murray City, Utah 84107
(801) 266-1337

SEATTLE
Vendor's Service Center, Inc.
221 Yale Avenue North
Seattle, Washington 98109
(206) 623-0851

MANUFACTURER'S REPRESENTATIVES (SALES)

CRESTLINE, OHIO
Ken Zehnder and Assoc.
300 Warehouse Rd.
Crestline, Ohio 44827
(419) 683-1191

DENVER, COLO.
Anchor Sales Co.
4390 Fenton Street, Suite 202
Denver, Colorado 80212
(303) 420-4001

KANSAS CITY, MO.
R & S Sales Co., Inc.
204 West 3rd Street
Kansas City, Mo. 64105
(816) 474-9085

SACREMENTO, CALIF.
Mr. Lloyd Jones
2318 Regis Drive
Davis, Calif. 95616
(916) 758-2080

VANCOUVER, WASH.
Mr. Howard Seney
P. O. Box 268
Vancouver, Wash. 98660
(206) 694-2284

NEW YORK (LONG ISLAND)
Nordon Industries of Northeast
2809 Sandra Court
Medford, New York 11763
(516) 289-6467

ITALY
ISMEA
20090 Trezzano S/N
Pietro Verri
Milano, Italy
Phone: 445344-1/2/3

UNITED KINGDOM
National Rejectors, Ltd.
Beaumont Road
Banbury, Oxfordshire, Eng.
Phone: 50171

UNITED STATES
National Rejectors Industries
Highway 88, P. O. Box 1550
Hot Springs, Ark. USA 71901
Phone: (501) 767-2313

WEST GERMANY
Nat'l Rejectors, Inc. GMBH
2150 Buxtehude
Zum Fruchtof 6
West Germany
Phone: 04161-83051

NATIONAL REJECTORS INDUSTRIES,
P. O. Box 1550, Hot Springs, Arkansas 71901 (501) 767-2313

A DIVISION OF UMC INDUSTRIES, INC.

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Printed In U.S.A. 7293

TECHNICAL INFORMATION

SUBJECT: Buckpassers ($1 Bill Validator) Used In XChangers (30-08, 30-09 & 30-10 Series XChangers)

BULLETIN NO. 223A DATE July 1, 1974
Revised: June 27, 1977 A, C, D

RELATED OR REFERENCE INFORMATION

- Buckpasser Manual
- T. I. 211
- T. I. 220

INCLUDE THIS BULLETIN AS PART OF THE BUCKPASSER OPERATION & SERVICE MANUAL

A. The 34-04-005 and -105 have been the two models used in all NRI XChangers. The difference between a 34-04-005 and a 34-04-105 is that the -105 has **"Anti Retrieval"** components added in the bill path. The last three (3) digits of the model number are changed by adding +100 to denote inclusion of Anti-Retrieval parts. The Anti-Retrieval System is adjustable throughout a very wide range — wide open bill path to a closed bill path. The purpose of the system is to assist in eliminating the pulling of an object back through the validator once it exits the rear and goes into the cash box (stacker, etc.).

As of about November, 1973, the 34-04-005's and -105's had two other improvements incorporated into all production units.

1. **Added "Inhibit Function"** which meant that Pin 2 (top-center of rear molex connector) of the validator was used. Pin 2 had been spare (without male terminal) prior to this change. The purpose was to keep the electronics constantly energized at all times. This affords superior protection against potential jackpot problems and increases the life expectancy of electronic components.

   In terms of using Buckpassers with or without "Inhibit" in XChangers either unit could be used in any XChanger except the 30-10 series) and function properly. This is because all XChanger cabinet harnesses have always had a wire in the Pin 2 position of the validator connector.

   The only new thing to remember here is that two power boards now exist. The 18237-2 which is the Standard Power Board **without** Inhibit and the 18237-5 Power **with** Inhibit, plus the 30-10 XChanger Jr. requires Inhibit.

   The Standard Power Board (18237-2) is usable in all 34-04 buckpassers. However, the buckpasser with pin 2 utilized has two extra wires internally that connect to the Inhibit System on the Inhibit Power Board (18237-5). If the standard board is used in the Inhibit (pin 2) buckpasser then the extra two wires must be insulated and tied back. Also pins 1 & 2 in the buckpasser reversed (swap positions) to keep the buckpasser from taking bills during XChanger Payout Cycle or when the XChanger is empty.

2. **Added Isolated Vend Circuit** — Easily identified by noting that pins **3-5** and **7** are now used in the molex connector on rear of validator. The purpose was to add additional protection against potential jackpot problems.

   Harness design in the 30-08 (drum) and 30-09 (new cartridge) is such that the "Isolated Vend Circuit" **is required** or the XChanger will not function properly.

2. **Isolated Vend Circuit** (cont.)

Buckpassers **with** "Isolated Vend Circuit" are usable in all XChangers (30-05, 06, 07, 08, 09 & 10).

Buckpassers **without** "Isolated Vend Circuit" are usable **ONLY IN** 30-05, 30-06, 30-07 and **30-10 (XChanger Jr.)** Series XChangers. To use buckpassers without isolated vend in 30-08 (Drum) or a 30-09 (new cartridge) three wires must be added within the validator as follows:

a. Wire from Pin 3 to common (c) terminal of unused pole on vend relay socket.

b. Wire from Pin 5 to normally closed (N.C. — de-energized) terminal of unused pole on vend relay socket.

c. Wire from Pin 7 to normally open (N.O. — energized) terminal of unused pole on vend relay socket.

The addition of these three (3) wires makes this buckpasser compatible with all XChangers (30-10's requires Inhibit but not Isolated Vend).

The part numbers and electrical details of the "Inhibit" changes have always been in the buckpasser operation and service manual.

B. In May, 1974, XChangers (30-08, 30-09 and 30-10) were shipped with a **new series Buckpasser,** Model Series 34-05-105 or -115 (XChanger Jr.).

NRI now features buckpassers of three different series for XChangers.

1. **34-04**-005, 105 Series — being gradually phased out in mid-74.

2. **34-05**-005, 105, 115 (*) Series — placed into production in May, 1974. Features improved functions within the electronics, along with improved reliability compared to the 34-04 Series.

All units in this model series are usable in **all** XChangers. They have inhibit and isolated vend functions as did its predecessor (34-04-005, -105).

This unit will be the standard model to replace the 34-04 buckpasser.

3. 34-06-005, 105, 115 (*) Series — Presently available for XChanger application as an option. This unit features additional security in the technique of validating U. S. $1 bills.

This series is usable in **all** XChangers. The Logic Board differs from that used in the 34-05's for XChanger application.

(*) New model number required for XChanger Jr. (30-10). Same as -105 except uses four shoulder screws in lieu of brackets for mounting. Shoulder screw part No.'s are 9126-27. Mounting brackets, quick change style, part No.'s are 18601 and 18601-1 Mounting Plate and 18602 latch using screw PN 9463-9 (8-32x¼" BHSM).

AP Marriot

C. Differences in parts between the 34-04, 34-05 and 34-06 Series Buckpassers for XChanger applications.

The following items depict the differences between these three model series. The basic difference is the newly designed electronics, which has both functional and longevity advantages over the 34-04's, as utilized in the 34-05's and 34-06's.

		34-04-005 34-04-105 34-04-115	34-05-005 34-05-105 34-05-115	34-06-005 34-06-105 34-06-115
1.	PCB Assembly	18233-3 (a) 18233-6 (b)	18629-5	18629-2
	Power	18237-2 (a) 18237-5 (b)	18846	18846
	Logic	18239-2 (a&b)	19117	18845
2.	Motor	18214	18638 (lo noise) (Barber Coleman Part No. CYQM 23360-3-1	18638 (lo noise)
3.	Bill Guide	18226-2	18586 (new head positions)	18586 (new head positions)
4.	Platen Assembly	18316 (pin w/o shoulder) *18316-5 (pin w/ shoulder 4 places)	18316-3 (pin w/shoulder 4 places)	18316-3
5.	Head Brackets	18227-2 (frt) 18227-3 (rear)	18227-4 (2 per) frt-rear, same	18227-4 (2 per)
6.	Roller Arm Spring (for heads)	8974-3	8974-13	8974-13
7.	Scan Head Roller Arm Assembly	18222 (2 per)	18623 Long 18623-1 Short	18623 Long 18623-1 Short
8.	Drive Pressure Roller Spring (used w/platen assembly)	18240 (6 per) or *18240 (2 per) 18240-2 (4 per)	18240 (2 per) 18240-2 (4 per)	18240 (2 per) 18240-2 (4 per)
9.	Fuse (for motor)	15414-10, 3/8 amp MDL slo-blo	15414-5, 7/10 amp MDL slo-blo	15414-5, 7/10 amp MDL, slo-blo
10.	**Anti Retrieval Parts**			
	(A) Pressure block & adjust assy	18609	18609	18609
	(B) Anti Retrieval teeth	18606	18606-1	18606-1
	(C) Spring (2 per)	8987-4	8987-4	8987-4
	(D) Anti Retrieval Plug (plastic)	18608	18608	18608

D. General Service Information:

1. The same warranty is applicable to the 34-05 and 34-06 buckpassers as is in effect for the 34-04 series.

   Should repair of a 34-05 or a 34-06 be made requiring use of a soldering iron it is necessary to use a "Grounded Tip" type iron if the point to be soldered is electrically common to either of the two printed circuit boards.

   The reason for the grounded tip iron is that all "C-MOS" type integrated circuitry can be harmed by large static and transient voltage potentials.

2. The adjustments for the Drive Train remain the same for all models with the following exception. A Spacer, Part No. 8804-270, was added between the worm and the hub of the motor. The purpose being to eliminate excess end-to-end play of the motor shaft.

   The worm is to be positioned on the shaft of the motor such that a .002 feeler will fit with a slight drag between it and the spacer. This adjustment is checked with the play in the motor shaft removed by pushing the shaft toward the worm. The worm should be rotated by hand to insure adequate clearance at all points.

   Do not adjust 34-05 or 34-06 type boards — the motor speed is not adjustable without using precision measurement equipment. Field adjustment of the motor speed for 34-05 and 34-06 type boards invalidates NRI's warranty. However the 34-04 type board motorspeed is adjustable as per the buckpasser manual.

   The gears in the NRI buckpasser require Mobilux Grease only, NRI PN 10449-2.

3. The 12-02-082 Test Cord is to be utilized in functionally testing all series specified in this tech bulletin.

   The functional test procedure, as defined in the buckpasser manual, is applicable for all three Series, 34-04's, 34-05's and 34-06's.

   The 34-06 series **may or may not** have a poor bill acceptance rate when U.S. $1 bills are inserted face-up and the top of George's head to the left.

4. All **XChanger Jr.'s require buckpassers with inhibit function** but not with isolated vend function.

TP1

TP2

C1 .22

IC1 U6567V

R1 12.7K 1/8W

C2 .068

C3 .22

C4 2.2/120V

R2 100K

R3 100

C5 .1

+12V

R4 5.6K

IC7 4049

CR1 6.2V

C7 15/20V

C8 .1

R6 820 1W

+24V

PART OF P2
HEAD AMP SIGNAL
$1 CONTROL

R7 22K

R8 15K

R41 22K

PART OF P3

SW A 5

SW B 4

SW C 3

SW COM. 2

R11 12K

R12 12K

R14 12K

R15 12K

R16 12K

R17 12K

C10 .01

C11 .01

R23 100K

Q5 2N4248

R24 100K

C13 .22

CR13 1N914

R25 15K

R26 15K

Q4 2N3392

R27 20K

R28 2.2K

IC8 4011

IC11 4023

IC9 4011

R9 2.2M

IC5 4025

IC3 4049

IC2 4001

IC4 4001

C12 .1

R40 1.2M

C21 .1

CR19 IN914

R29 270K

C14 1

R35 56K

R5 56K

PART OF P2

+12V

+24V

CIRCUIT GROUND

+24V

R31 120-1.W.

Q6 2N2219A

R32 1K

C15 6.8/35V

C16 .01

CR14 1N964B

C17 .1

C18 2.7/20V

C19 .01

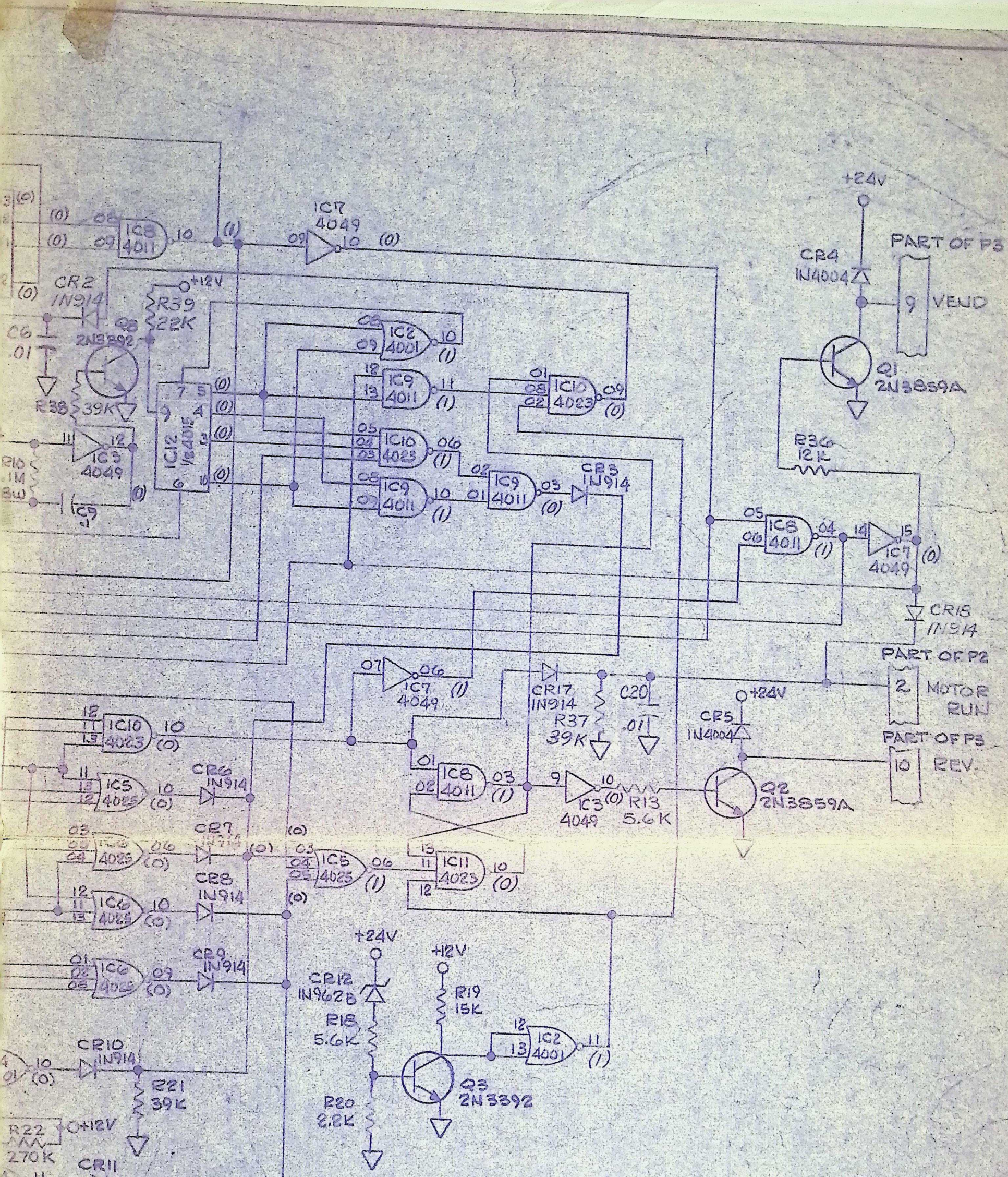
CR15 1N5247B

C22 2200pf/50V

R33 1K

R34 2.2K

Q7 2N3391



NOTE!

1. ALL CAPACITOR VALUES ARE MF UNLESS OTHERWISE STATED.
2. ALL RESISTOR VALUES ARE GIVEN IN OHMS & ARE 1/4 WATT UNLESS OTHERWISE STATED.
3. NUMBERS IN PARANTHESIS INDICATE LOGIC LEVEL AT STANDBY.
4. ⏚ DENOTES CIRCUIT GROUND.

34-06-105

10	4022	IN5247B W/ 1N964B	MB 3/5/81
9	0850	R27 MAS 12K	
8	0850	ADD C22	
7	1940	ADD R41, CR20	JC 10-27-78
6	2052		
5	0850		
4	0692	REVERSED	
3	0670		
2	0541		
1		ADD C29, 33, 37 SCR 12	
REV.	ECN NO.	CHANGE	DATE BY

TOLERANCES UNLESS OTHERWISE SPECIFIED .0 = ± .030 .00 = ± .010 .000 = ± .005 ANGULAR = ± 1°	CHECKED MG 9-25-73	APPROVED RWC 9-27-73	FINISH
TOLERANCES ARE NONCUMULATIVE	DRAWN JHL 9-25-73	SCALE NONE	NATIONAL REJECTORS, A DIVISION OF UMC INDUSTRIES, INC. P. O. BOX 1550 HOT SPRINGS ARKANSAS 71901
DIMENSIONS ARE BEFORE PLATING OR PAINTING	NAME #1 LOGIC BOARD SCHEMATIC		NUMBER 19100-615

PART OF P1B

24 VAC 1 — 10

24 VAC 2 — 12

C1 .01

R1 100

CR1 1N4004

CR2 1N4004

CR3 1N4004

CR4 1N4004

0V+

Q1 (MTD ON HEATS TIP110

R2 820 1W

C2 470/ 50V

CR5 24V 1N4749

C3 .01

PART OF P1A

CIRCUIT GROUND — 4

+12V

PART OF P1B

MOTOR RUN INDICATION — 11 (0)

TACH — 14

TACH — 13

CR6 1N914

CR7 1N914

CR8 1N914

CR9 1N914

R3 22K

R4 3.9K

R6 8.2K

CR10 1N914

R7 22K

C7 .01

Q2 2N 3392

IC1 LE 555V (1) (0)

C10 .047

C9 .01

C8 .1

R9 12K

R10 12K

R13 22K

Q4 2N3392

R11 22K

PART OF J2

MOTOR RUN — 2

+12V — 7

IC3 4011

R8 12K

Q3 2N 3392

C14 .01

C15 15/ 20V

+12V

R30 12K

CR23 1N914

CR22 1N914

IC3 4011

R31 470K

C16 .1

C17 6.8/35

+12V

R37 22K

CR17 1N914

E1 White

#1 INHIBIT

R35 22K 1W

CR15 1N4004

IC4 MOC 1000

INHIBIT COMMON

E2 Red

+12V

R38 22K

CR18 1N914

IC5 MOC 1000

⚠1 #2/#5 INHIBIT

E3 Blk

CR16 1N4004

R36 22K 1W

C25 150Pf

R50 270K

C23 39Pf

+12V

IN5298 CR19

C24 .1

R48 5.6K

R47 1.2M

+24V

+12V

1/2 MC1458 IC6

R49 270K

PART OF P1A

HEAD 1 — 1

HEAD 2 — 2

HEAD SHIELD — 3

C22 .1

R44 18 K

R45 6.8K

R46 5.6K

C26 .01

C27 .1

C28 .01

NOTE:

5. THE TERM #2/#5 MEANS THAT THE SIGNAL SO MARKED PERFORMS A FUNCTION RELATED TO #2 BILLS IN #1-#5 VALIDATORS & SIMILARLY FOR #1-#5 VALIDATORS.

REV.	ECN. NO.	CHANGE	DA
6	NRI-117	R44 FROM 27K TO 18K	NR
5	4289	CR19 WAS SCL1R	

PART OF J2

4 +24V

6 60HZ CLOCK

5 CIRCUIT GROUND

C6 .1

C4 6.8/ 35V.

C5 .01

C11 .01

R18 680K

C12 .1

+12V

+24V

R14 12K

C13 .01

R15 22K

R17 2K

R16 8.2K

IC2 +741

CR11 IN753

R19 4.7K

C18 .22

0V+

R23 56

R24 22

CR13 IN914

Q7 2N 4248

R25 10

Q8 (RCA) 64584. (MOUNTED ON HEATSINK)

R22 1K

Q6 2N 3859A

CR12 IN914

R20 56

R21 22

R26 5.6K

R27, 22.K

C19 .1

CR14 IN4004

PART OF PIA

5 +24V

7 MOTOR DRIVE

PART OF PIB

9 MOTOR RETURN

R28 2.7K

R51 2.7 1WATT

29.4K

R33 270K

IC3 4011

R34 22K

Q5 2N 3392

R32 4.7M

Q9 2N 3392

+12V

R41 39K

IC3 4011

PART OF J2

3 CURRENT SENSE

+12V

R39 2.2M

C20 .1

9 $1 CONTROL

+12V

R40 2.2M

C21 .1

10 $2/$5 CONTROL

1 HEAD AMP. SIGNAL

NOTE!

1. ALL CAPACITOR VALUES ARE MF UNLESS OTHERWISE STATED.
2. ALL RESISTORS VALUES ARE GIVEN IN OHMS & ARE 1/4 WATT UNLESS OTHERWISE STATED.
3. NUMBERS IN PARENTHESIS INDICATE LOGIC LEVELS AT STANDBY.
4. ⏚ DENOTES CIRCUIT GROUND.
5. REF. P.C. BOARD ASS'Y. 07-19-140.

REV.	ECN NO.	CHANGE	DATE BY
4	4257	Q1 was 2N5294 LB	10/9/81
3	3645	E, C2 WAS 500 uF, ADD NOTE	6/11/80
2	2346	WAS 12K R35 & R36 WAS 33K, R49	6/23/77
1	1917	E3. WAS #5 INHIBIT, J210 WAS #5 CONTROL ADD NOTE "5"	7-15-76

- TOLERANCES - UNLESS OTHERWISE SPECIFIED
.0 = ± .030
.00 = ± .010
.000 = ± .005
ANGULAR = ± 1°

TOLERANCES ARE NONCUMULATIVE

DIMENSIONS ARE BEFORE PLATING OR PAINTING

CHECKED HIGHTOWER 12-6-74

APPROVED RWL 12-9-74

DRAWN J. HILL 11-23-74

SCALE NONE

34-08-105

FINISH

NRI NATIONAL REJECTORS
A DIVISION OF UMC INDUSTRIES, INC.
P. O. BOX 1550
HOT SPRINGS
ARKANSAS 71901

NAME POWER BOARD SCHEMATIC 10100-663

NUMBER 10100-663

10-663-00101

4185

TP3 (885 Hz)

TP1 (1243 Hz)

TP2

PART OF P2

CURRENT SENSE 3

HEAD AMPLIFIER SIGNAL 1

$1 CONTROL 9

$5 CONTROL 10

PART OF P3

SWITCH "A" 5

SWITCH "B" 2

SWITCH "C" 4

SWITCH COMMON 3

PART OF P2

60 HZ CLOCK 6

+12 V 7

+24 V 4

CIRCUIT GROUND 5

R1 15K

R2 22K

R3 10K C.W.

R4 14.7K

C1 .068

C2 .22

C3 .22

R5 100K

R6 100

C4 3.3/15V

C5 .1

R7 5.6K

R8 10K C.W.

R9 7.5K

C6 .068

C7 .22

C8 .22

R10 100K

R11 100

C9 2.2/20V

C10 .1

R12 5.6K

C11 .1

C12 15/20V

Q1 2N2219A

R13 240

R14 2.2K

R15 470 1/2 W

R16 2.2K

Q2 2N3392

CR1 IN5230

+2-4

CR2 IN914

C13 .22

CR3

R17 100K

C14 .1

Q5 2N4248

R20 12K

CR4 IN914

R21 6.8K

R22 39K

R24 5.6K

R52 15K

Q4 2N3392

C22 .22

R25

R26 12K

R23 39K

CR5 IN914

CR6 IN914

CR29 IN 914

R53 95.3K 2%

C25 .01

C24 .01

R54 12.K

R55 12K

CR7 IN914

R27 39K

R28 39K

R29 12K

R30 12K

R31 12K

R32 12K

R33 12K

R34 12K

CR8 IN914

CR9 IN914

CR10 IN914

CR11 IN914

R38 270K

CR19 IN914

CR18 IN914

CR13 IN914

CR14 IN914

CR15 IN914

R36 39K

CR16 IN914

CR17 IN914

R37 39K

R44

CR12 IN914

C23 .01

R46 100K

R45 56K

R47 120 1W.

Q6 2N2219A

R48 1K

CR25 IN964B

C16 6.8/35V

C17 .01

C18 .01

C19 .01

C20 .01

+12V

NE567V

4030

4001

4049

4015

4023

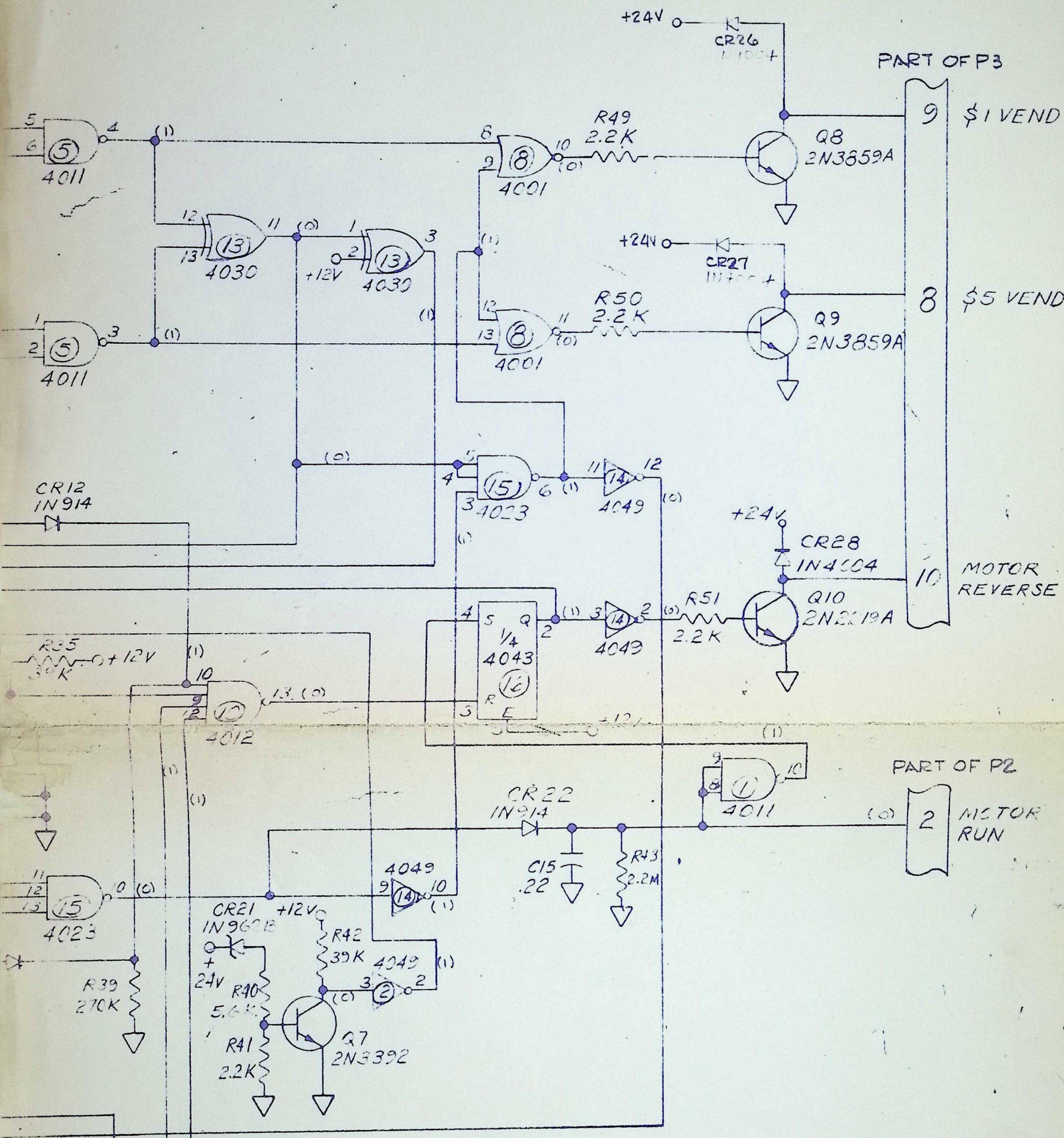
4011

4024

4043

4012

4081



NOTE:

1. ALL CAPACITOR VALUES ARE IN μf UNLESS OTHERWISE STATED.
2. ALL RESISTOR VALUES ARE GIVEN IN OHMS & ARE 1/4 WATT UNLESS OTHERWISE STATED.
3. NUMBERS IN PARANTHESIS INDICATE LOGIC LEVELS AT STANDBY.
4. ⏚ DENOTES CIRCUIT GROUND.

LTR	DESCRIPTION	ECO NO.	DATE	Approved by
E	NOTE REMOVED FREQ ADD REMOVED Q3&CR18 & R19	NRI-254	6-23-86	HcH
D	C23, C24, C25 ADDED	NRI-236	11-27-85	HcH
A	CHANGE R1, R2, C1 R1 = 1K TO 1M, C1 = 10100-636	NRI-10		N
B	R25 WAS 47-	NRI-200	1-2-85	
C	R5 WAS 470	NRI-207		

REVISION

PART NO.	PART NAME	DATE
10100-785	$1 & $5 LOGIC SCHEMATIC	8-20-84

MATERIAL ~ FINISH ~ Drawn by MC Checked by AHM Approved by

SCALE

NATIONAL VENDORS®
A DIVISION OF UMC INDUSTRIES, INC.
ST. LOUIS, MO.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES UNLESS OTHERWISE SPECIFIED • 2 PLACE DECIMAL ± .02 • 3 PLACE DECIMAL ± .005 • ANGLES ± 1/2° EXCEPT FORMED ANGLES ± 1° • CONCENTRICITY T.I.R .010

SD233

NRI #10100-663

PART OF PIB
24V AC1 10
24V AC2 12
C1 .01
R1 100
CR1 IN4004
CR2 IN4004
CR3 IN4004
CR4 IN4004
V+
Q1(MTD ON HEATSINK) TIP110
R2 820 1W 10%
C2 470 50V
CR5 24V IN4749
C3 .01
PART OF PIA
CIRCUIT GROUND 4

+12V
R6 8.2K
CR10 IN4148
R7 22K
C7 .01
C8 .1
C10 .047
C9 .01
IC1 555

PART OF PIB
MOTOR RUN INDICATION 11
TACH 14
TACH 13
CR6 IN4148
CR7 IN4148
CR8 IN4148
CR9 IN4148
R3 22K
R4 3.9K
Q2 2N3392

TP*
R9 12K
R10 12K
R13 22K
Q4 2N3392
R11 22K

PART OF J2
MOTOR RUN 2
+12V 7
IC3 4011
R8 12K
Q3 2N3392
C14 .01
C15 15 20V

R30 12K
CR23 IN4148
CR22 IN4148
IC3 4011
R31 470K
C16 .1
C17 6.8 35V

$1 INHIBIT
E1
R35 22K 1W 10%
CR15 IN4004
IC4 4N26
R37 22K
CR17 IN4148

INHIBIT COMMON
E2
R38 22K
CR18 IN4148

$5 INHIBIT
E3
CR16 IN4004
R36 22K 1W 10%
IC5 4N26

C25 150pf
C23 39pf
R47 1M 1%
C24 .1
R48 562K 1%
R60 500K
R50 294K 1%

PART OF PIA
HEAD 1 1
HEAD 2 2
HEAD SHIELD 3
CR19 IN5298
C22 .1
R44 15K 1%
R45 6.8K
R46 5.6K
C26 .01
C27 .1
C28 .01
R49 270K
+24V
1/2 MC1458 IC6

NOTES:
1. ALL CAPACIT
2. ALL RESISTO
5% UNLESS
3. NUMBERS IN
4. ▽ DENOTES
5. R17 ADJUSTE
MEASURED

PART NO.	PART NAME	DATE
SD233	$1+$5 PWR. BD. SCHMATIC-CR (FOR 5260439 PCB ASSY)	7-31-86

MATERIAL: —— FINISH: —— Drawn by: SH

NATIONAL VENDORS®
A DIVISION OF UMC INDUSTRIES, INC.
ST. LOUIS, MO. 63115

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES UNLESS OTHERWISE SPECIFIED • 2 PLACE DECIMAL ± .02 • 3 PLACE DECIMAL ± .005 • ANGLES ± 1/2° EXCEPT FORMED ANGLES ± 1° • CONCENTRICITY T.I.R. .010

SCALE: NONE — Checked by: HcH — Approved by:

REVISION				
LTR	DESCRIPTION	ECO NO.	DATE	Approved by
G	REVISED & REDRAWN SUPERSEDES NRI PART #10100-663	NRI-253	8-3-86	HcH

PART OF J2
4 +24V
6 60HZ CLOCK
5 CIRCUIT GROUND

C4 6.8 35V
C5 .01
C6 .1
C11 .01
R18 680K
C12 .1
+12V
R14 12K
+24V
C13 .01
R15 22K
R17 2K
CW
R16 8.2K
IC2 LM741
CR11 IN753
R19 4.7K
V+
R23 56
CR13 IN4148
R24 22
Q7 2N4248
R25 10
R22 1K
Q8 RCA (MTD ON HEATSINK) 64584
Q6 2N3859A
CR12 IN4148
R26 5.6K
R28 2.7K
C19 .1
CR14 IN4004
PART OF PIA
5 +24V
7 MOTOR DRIVE
PART OF PIB
9 MOTOR RETURN
C18 .22
R20 56
R21 22
R27 22K
R29 1.8K
R51 2.7 1W
R33 270K
IC3 4011
R34 22K
Q5 2N3392
R32 4.7M
Q9 2N3392
+12V
R41 39K
IC3 4011
+12V
R39 2.2M
C20 .1
+12V
R40 2.2M
C21 .1
PART OF J2
3 CURRENT SENSE
9 $1 CONTROL
10 $5 CONTROL
1 HEAD AMP SIGNAL

R VALUES ARE μF UNLESS OTHERWISE STATED.
S VALUES ARE GIVEN IN OHMS & ARE 1/4 WATT
THERWISE STATED.
PARENTHESIS INDICATE LOGIC LEVELS AT STANDBY.
CIRCUIT GROUND.
FOR MOTOR SPEED OSC FREQUENCY OF 945 HZ
TP* DURING FACTORY ASSY.

RELATIONSHIP BETWEEN PHASE LOCK LOOP OSCILLATOR FREQUENCY AND MOTOR SPEED TIMER(555) FREQUENCY
(ONE DOLLAR BILL)

6/7/84

OSC. FREQ. (HZ)	555 FREQ. (HZ)	OSC. FREQ. (HZ)	555 FREQ. (HZ)	OSC. FREQ. (HZ)	555 FREQ. (HZ)	OSC. FREQ. (HZ)	555 FREQ. (HZ)	OSC. FREQ. (HZ)	555 FREQ. (HZ)
1054	801	1100	836	1146	871	1192	906	1238	941
1055	802	1101	837	1147	872	1193	907	1239	942
1056	803	1102	838	1148	872	1194	907	1240	942
1057	803	1103	838	1149	873	1195	908	1241	943
1058	804	1104	839	1150	874	1196	909	1242	944
1059	805	1105	840	1151	875	1197	910	1243	945
1060	806	1106	841	1152	876	1198	910	1244	945
1061	806	1107	841	1153	876	1199	911	1245	946
1062	807	1108	842	1154	877	1200	912	1246	947
1063	808	1109	843	1155	878	1201	913	1247	948
1064	809	1110	844	1156	879	1202	914	1248	948
1065	809	1111	844	1157	879	1203	914	1249	949
1066	810	1112	845	1158	880	1204	915	1250	950
1067	811	1113	846	1159	881	1205	916	1251	951
1068	812	1114	847	1160	882	1206	917	1252	952
1069	812	1115	847	1161	882	1207	917	1253	952
1070	813	1116	848	1162	883	1208	918	1254	953
1071	814	1117	849	1163	884	1209	919	1255	954
1072	815	1118	850	1164	885	1210	920	1256	955
1073	815	1119	850	1165	885	1211	920	1257	955
1074	816	1120	851	1166	886	1212	921	1258	956
1075	817	1121	852	1167	887	1213	922	1259	957
1076	818	1122	853	1168	888	1214	923	1260	958
1077	819	1123	853	1169	888	1215	923	1261	958
1078	819	1124	854	1170	889	1216	924	1262	959
1079	820	1125	855	1171	890	1217	925	1263	960
1080	821	1126	856	1172	891	1218	926	1264	961
1081	822	1127	857	1173	891	1219	926	1265	961
1082	822	1128	857	1174	892	1220	927	1266	962
1083	823	1129	858	1175	893	1221	928	1267	963
1084	824	1130	859	1176	894	1222	929	1268	964
1085	825	1131	860	1177	895	1223	929	1269	964
1086	825	1132	860	1178	895	1224	930	1270	965
1087	826	1133	861	1179	896	1225	931	1271	966
1088	827	1134	862	1180	897	1226	932	1272	967
1089	828	1135	863	1181	898	1227	933	1273	967
1090	828	1136	863	1182	898	1228	933	1274	968
1091	829	1137	864	1183	899	1229	934	1275	969
1092	830	1138	865	1184	900	1230	935	1276	970
1093	831	1139	866	1185	901	1231	936	1277	971
1094	831	1140	866	1186	901	1232	936	1278	971
1095	832	1141	867	1187	902	1233	937	1279	972
1096	833	1142	868	1188	903	1234	938	1280	973
1097	834	1143	869	1189	904	1235	939	1281	974
1098	834	1144	869	1190	904	1236	939	1282	974
1099	835	1145	870	1191	905	1237	940	1283	975

CONVERSION FACTOR = .760 (i.e. 555 FREQ. = .760 * OSC. FREQ.)

URI #1 BUCKPASSER -2

test OSC. frequency at TP2 (inner post), ground = #5 of 'P2'

test pt. for meter adjust pot. is resistor (R9) sticking up inside of 'IC1' (8 pin 3) on power bd. 'IC1' is DIP8 chip behind 'P3 header'.

get meter speed from chart.

NATIONAL - BUCK PASSER
$1/$5 DOUBLE BOARDS.

TP1 1) set $1 shaft loop occ. = 1243 Hz
TP3 2) set $5 " " = 887 Hz.

3) set motor speed to - 945 Hz

FOR THIS BOARD SET-UP, THESE FIGURES SUPERCEED $1 CHART.